ADDENDUM - FURTHER ASSESSMENT OF SOILS CONTAINING RESIDUAL PERCHLORATE

Azusa Irwindale Study Area

Former Aerojet-General Corporation Facility

Azusa and Irwindale, California

Prepared for:

California Regional Water Quality Control Board
Los Angeles Region

RWQCB File No. 108.1692; SLIC ID. No. 2049R00

Prepared by:

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May 31, 2007

Project No. 007190.006.0

Geomatrix

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CALIFORNIA REGIONAL WATER
QUALITY CONTROL BOARD
LOS ANGELES REGION

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Azusa/Irwindale Study Area
Azusa and Irwindale, California

May 31, 2007
007190.006

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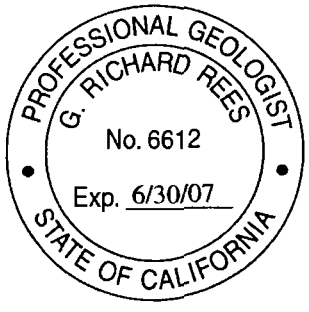

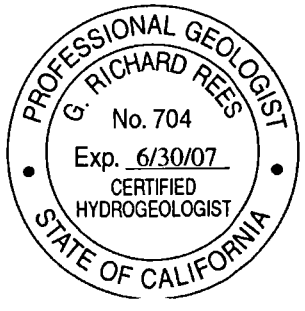

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ADDENDUM - FURTHER ASSESSMENT OF SOILS CONTAINING RESIDUAL PERCHLORATE

Azusa Irwindale Study Area
Azusa and Irwindale, California

1.0 INTRODUCTION

Geomatrix Consultants, Inc. (Geomatrix), on behalf of Aerojet-General Corporation (Aerojet), has prepared this addendum (Assessment Addendum) to the Geomatrix report entitled *Further Assessment of Perchlorate in Soils Containing Residual Perchlorate*, dated April 18, 2006, (Further Assessment Report) (Geomatrix, 2006a). The purpose of this Assessment Addendum is to present: (1) the findings of work completed in general accordance with the *Second Work Plan Addendum, Further Assessment of Perchlorate in Soils in Areas of Concern*, dated July 18, 2006 (Second Work Plan Addendum) (Geomatrix, 2006b) in areas on or adjacent to the former PerkinElmer Optoelectronics SC, Inc. (PerkinElmer) property at the Azusa Irwindale Study (AISA), in Azusa and Irwindale, California; and (2) development of a revised Soil Screening Level (SSL) for perchlorate in the shallow vadose zone that is protective of underlying groundwater. Information presented in this Assessment Addendum includes boring logs, laboratory analytical reports, summary analytical tables, isoconcentration contour maps, and cross sections associated with additional soil sampling completed in March and April 2007 to address data gaps identified in the Further Assessment Report. In addition, this Assessment Addendum presents an additional evaluation of a Soil Screening Level (SSL) for perchlorate in soil that is protective of underlying groundwater with the Point of Compliance (POC) at the water table below soils affected with perchlorate as requested in a letter from the Los Angeles Regional Water Quality Control Board (LARWQCB) dated January 3, 2007.

1.1 SITE LOCATION AND DESCRIPTION

The former PerkinElmer property is located within the Azusa Irwindale Study Area (AISA), which consists of properties formerly owned or leased by Aerojet covering an area of approximately 125-acres in Azusa and Irwindale, California (Figure 1-1). For purposes of this report, the former PerkinElmer property and adjacent are referred to as the Study Area. The location of this Study Area within the AISA is shown on Figure 1-2 and a detailed Study Area site map is shown on Figure 1-3. The former PerkinElmer property consists of four parcels (Figure 1-3):

- Two parcels on the western side of the property that are occupied by existing Buildings 1 and 2,
- One parcel on the northeast corner of the property occupied by existing Building 3, and
- One parcel on the southeast part of the parcel occupied by existing Building 4.

PerkinElmer sold all of these properties by the end of 2005. Proficiency SGV LLC (Proficiency) currently owns the two western parcels (Buildings 1 and 2). The Joseph Family Trust purchased the southeastern parcels (Building 4) from Proficiency in early 2006. Dragonis Investments, LLC (Dragonis), currently owns the northeastern parcel with Building 3.

1.2 BACKGROUND INFORMATION

Only background information following submittal of the April 18, 2006 Further Assessment Report is provided in this Assessment Addendum. Background information prior to the April 18, 2006, is summarized in the Further Assessment Report.

Following submittal of the Further Assessment Report, a technical meeting was held at the Los Angeles Regional Water Quality Control Board (LARWQCB) office on June 14, 2006, to present and discuss the findings with LARWQCB staff. At the conclusion of the meeting, it was agreed that Aerojet and its consultants would prepare a second addendum to the work plan for additional soil sampling to address data gaps, revise the variably-saturated flow and solute transport modeling presented in the Further Assessment Report, setting the POC at the water table rather than the site boundary, and present these findings in an addendum to the Further Assessment Report. It was agreed that a revised Remedial Action Plan (RAP) would be prepared following submittal of the addendum to the Assessment Report (this Assessment Addendum) and anticipated receipt of comments from the LARWQCB indicating that the characterization of the lateral and vertical extent of perchlorate was complete.

Geomatrix submitted the Second Work Plan Addendum to the LARWQCB on July 18, 2006. The LARWQCB approved the scope of work described in this work plan addendum in LARWQCB letter dated January 3, 2007, but stipulated conditions for approval. Geomatrix prepared a response letter dated January 31, 2007 (Geomatrix, 2007a), that responded to each of the eight conditions stipulated by the LARWQCB. This January 31, 2007 letter included, as an attachment, a memorandum describing soil excavation, soil removal, and confirmation soil sampling of the excavation related to the construction of a truck well at the east side of

Building 2 (see Figure1-3 for location). The January 31, 2007 Memorandum is incorporated in this Assessment Addendum by reference and the results of the Building 2, truck well excavation, confirmation soil sampling are provided on Plate 1.

The LARWQCB responded in another letter dated March 12, 2007, and accepted the revised sample locations, boring depths, and sample intervals, but rejected Aerojet's proposed submittal date of May 31, 2007 for the technical report and maintained that the required submittal date for a technical report was April 30, 2007. Aerojet responded to the LARWQCB in a letter dated March 26, 2007 and proposed the submittal of a Data Summary Report by April 30, 2007 and a more comprehensive technical report on or before May 31, 2007. Geomatrix, on behalf of Aerojet, submitted the Data Summary Report (Geomatrix, 2007b) to the LARWQCB on April 30, 2007.

1.3 REPORT CONTENTS

The remainder of this report describes the field methods and analytical results associated with sampling activities to address data gaps in characterization of soils containing residual perchlorate in the Study Area as outlined in the Second Work Plan Addendum and presents an updated evaluation of the lateral and vertical extent of soils affected with residual perchlorate in the Study Area and an additional evaluation of the Soil Screening Level (SSL) for perchlorate in soil. In addition, the results of confirmation soil sampling from the truck well at Building 2 (Geomatrix, 2007a), are incorporated in this Assessment Addendum.

Site conditions including site geology and site hydrogeology and summary of previous investigations are the same as reported in Section 2 and Section 3 of the Further Assessment Report and are not repeated in this Assessment Addendum. Details of the work plan implementation are provided to document the March and April 2007 drilling and sampling that was conducted using the sampling procedures described in the *Work Plan for Further Assessment of Perchlorate in Soils at Areas of Concern* (Work Plan) (Geomatrix, 2005a); *Work Plan Addendum for Further Assessment of Perchlorate in Soils at Areas of Concern* (Work Plan Addendum) (Geomatrix, 2005b); and the Second Work Plan Addendum.

2.0 WORK PLAN IMPLEMENTATION

Drilling and soil sample collection to address data gaps identified in the Second Work Plan Addendum began on March 26, 2007. Soil boring locations, sample depths, and analyses are those proposed in the Second Work Plan Addendum and modifications documented in Table 1R and Figure 2R of Geomatrix's January 31, 2007 letter to the LARWQCB, with the following exceptions:

- As documented in Aerojet's March 26, 2007 letter to the LARWQCB, Aerojet agreed to provide a reporting limit for perchlorate soil analyses of 6 µg/kg as stipulated by the LARWQCB in its letter dated January 3, 2007. This lower reporting limit required a different and relatively recently EPA approved analytical method (EPA Method 6850). EPA Method 314.0 was previously used to analyze all of the soil samples for perchlorate to a reporting limit of 40 µg/kg. Although a lower reporting limit for perchlorate is provided for in this most recent assessment, characterization for the isoconcentration contour maps and consideration of the adequacy of characterization in this Assessment Addendum is based on concentrations of perchlorate in soil at or above 40 µg/kg. This is consistent with the LARWQCB request, also stated in the January 3, 2007, letter that isoconcentration contour maps be provided for known concentrations of perchlorate in soil above 40 µg/kg.

- Near-surface soil borings, PSZB-77, PSZB-78, PSZB-79, and PSZB-80 were proposed to a depth of 7.5 feet below ground surface (bgs) using hand methods (e.g., hand auger, post-hole auger, or air knife.) Soil samples from these locations were successfully collected at 1, 2.5, and 5 feet bgs using an air knife and hand auger, however, attempts to sample to 7.5 feet bgs were abandoned using the hand method because of difficulty of advancing the borings in rocky soils to this depth and the increased potential that slough would contaminate the deeper sample. Analytical results from only one of these borings (PSZB-77) indicated perchlorate concentrations at depths of 2.5 and 5 feet bgs that warranted additional vertical characterization and this boring was sampled at additional depths of 7.5 and 10 feet bgs using a drill rig.

- Intermediate-zone boring PIZB-7 was advanced using an Air Rotary Casing Hammer (ARCH) rig equipped with a downhole hammer and under reamer bit (STRATEX) because the rig was available and the speed of drilling with this rig would reduce the duration of the field program by a day.

- Analytical results from soil samples collected in PSZB-77, PSZB-78, and PSZB-80 indicated that additional lateral characterization was needed in shallow soils to the south in the Northrop Grumman parking lot. As shown on Figure 1-3, two additional near-surface shallow borings were added as step-out locations to the south of PSZB-77 and PSZB-78 (PSZB-86 and PSZB-85, respectively) and one was added to the west of PSZB-77 (PSZB-87). These soil borings were advanced and sampled on April 20, 2007.

- Deep borings PDZB-18 and PDZB-19 were initially proposed for a depth of 200 feet bgs with the option of extending the boring to 250 feet bgs if analytical results warranted deeper sampling. To reduce drilling down time and the need for 24-hour turn-around-time analytical results, these borings were advanced to 250 feet bgs with soil samples collected to total depth.

Including the modifications described above, drilling and soil sample collection was performed at a total of 17 locations and consisted of seven shallow-zone borings advanced and sampled to 40 feet bgs (PSZB-74, PSZB-75, PSZB-76, PSZB-81, PSZB-82, PSZB-83, and PSZB-84); one intermediate-zone boring advanced and sampled to 100 feet bgs (PIZB-7); two deep-zone borings advanced and sampled to 250 feet bgs (PDZB-18 and PDZB-19); and seven near-surface borings advanced and sampled to depths ranging from 5 to 10 feet bgs (PSZB-77, PSZB-78, PSZB-79, PSZB-80, PSZB-85, PSZB-86, and PSZB-87). A total of 129 soil samples were collected and analyzed for perchlorate. The drilling and soil sampling program was completed on April 20, 2007.

The scope of work for this drilling and soil sampling program consisted of the following tasks:

- Pre-field activities;
- Drilling and soil sampling;
- Equipment wash and investigative derived waste disposal;
- Sample handling and analysis; and
- Surveying.

The methods used during this assessment, including pre-field activities, drilling, soil sampling, sample handling and analysis, surveying, equipment wash and investigative derived waste disposal are described in the following sections.

2.1 PRE-FIELD ACTIVITIES

The pre-field activities consisted of utility clearance, permitting, and preparation of a site-specific Health and Safety Plan (HSP). Specifically these activities included:

- Retaining Sub Surface Surveys, a private underground utility locator from Carlsbad, California, to screen the planned drilling locations for potential underground utilities or buried objects;
- Marking the drilling locations and notified Underground Services Alert (USA) of the planned subsurface assessment activities;
- Obtaining an encroachment permit from the City of Azusa for borings located in the public right of way; and
- Updating the project-specific HSP. A field copy of the HSP was maintained at the work site during all field activities. The HSP identified potential health and safety hazards associated with the field activities, outline general safe work practices for personnel at the site, define personal protective equipment requirements, and described specific measures to be undertaken in case of an emergency.

2.2 DRILLING AND LITHOLOGIC LOGGING

Geomatrix contracted with WDC Exploration and Wells (WDC), a licensed (C-57) drilling company from Montclair, California, to air-knife fifteen of the seventeen boring locations each to a depth of 5 feet bgs. Air-knifing was done to ascertain that boring locations were free from subsurface utilities and/or obstructions prior to drilling. Three of these borings were intended to be near-surface shallow borings and advanced to 5 feet bgs. In addition, WDC advanced two deep-zone borings each to a depth of 250 feet bgs and one intermediate-zone boring to a depth of 100 feet bgs between March 26 and April 3, 2007. Geomatrix contracted with Layne Christensen Company, a licensed (C-57) drilling company from Fontana, California, to advance an additional seven shallow-zone borings each to a depth of 40 feet bgs and one boring to a depth of 10 feet bgs between April 9 and April 12, 2007. Three additional near-surface shallow borings were added as step-out locations and were advanced to 5 feet bgs on April 20, 2007. Drilling was performed on all near-surface borings (5 feet bgs) using air-knifing methods. Drilling was performed on all shallow borings (40 feet bgs) using dual-wall casing, air percussion, hammer drilling methods. This method uses a hammer on the drill rig to drive the casing. High pressure air is pushed down the outer casing annulus to the drill bit at the bottom of the boring and carries the cuttings out of the boring through the inner casing annulus to a cyclone separator. Two deep-zone borings (250 feet bgs) and one intermediate-zone boring (100 feet bgs) were drilled using ARCH methods. This method is similar to the dual wall

percussion hammer but it uses a down-hole percussion hammer with an under reamer bit (STRATEX), attached to an approximately 4-inch outside diameter (OD) drive pipe inserted through a threaded drive casing. Soil cuttings are forced to the surface by negative air pressure imparted on the drilled formation between the drive pipe and casing and flow through a cyclone separator.

As anticipated, groundwater was not encountered in any of the borings drilled. The near-surface and shallow-zone borings (40 feet bgs) were backfilled with bentonite chips using the drive casing as a tremie. The bentonite chips were hydrated with a continuous stream of potable water as they were placed. The deep (250 feet bgs) and intermediate-zone borings (100 feet bgs) were backfilled with high solids bentonite grout using the drive casing as a tremie. The surface at each boring location was patched with asphalt. A summary of the soil sampling activities is provided in the following subsections. Boring locations are shown on Figure 1-3. Soil logging activities were performed by a Geomatrix field geologist under the supervision of a California Professional Geologist. The lithology was described from cuttings from the cyclone separator and classified in accordance with the United Soil Classification System (USCS) and recorded on a soil boring log for each soil boring. Visual grain-size distribution, color, moisture content, and other pertinent characteristics were included on the soil boring log. Boring logs are provided in Appendix A.

2.3 SOIL SAMPLING

Soil samples for chemical analysis from near-surface borings PSZB-77, PSZB-78, PSZB-79, PSZB-80, PSZB-85, PSZB-86, and PSZB-87 were collected at depths of 1, 2.5, and 5 feet bgs. Analytical results from PSZB-77 indicated concentrations at depths of 2.5 and 5 feet bgs that warranted additional vertical characterization and this boring was sampled at additional depths of 7.5 and 10 feet bgs using the drill rig. Soil samples for chemical analysis collected from shallow-zone borings PSZB-74, PSZB-75, PSZB-76, PSZB-81, PSZB-82, PSZB-83, and PSZB-84 were collected at depths of 1, 2.5, 5, 7.5 and 10 feet and then at 5-foot intervals to 40 feet bgs; with the exception of boring PSZB-76, where soil sample collection began at 7.5 feet bgs because this boring was a continuation sampling of an a nearby boring (PSZB-73) that warranted addition additional vertical characterization. Soil borings PDZB-18, PDZB-19 and PIZB-7 also were advanced for additional vertical characterization and soil sampling began below the depth of sampling from the nearby boring. Soil samples for chemical analysis from deep-zone borings PDZB-18 and PDZB-19, were collected beginning at a depth of 110 feet and then at every 10-foot interval to 250 feet bgs. Soil samples for chemical analysis from

intermediate-zone boring PIZB-7, were collected at depths of and 45 and 50 feet bgs and then at every 10-foot intervals to 100 feet bgs.

In general, soil samples from the upper 1 to 5 feet of each soil boring were collected using either a hand trowel or by hand augering to ensure sample retrieval. Soil samples collected below 5 feet within the borehole were collected at the desired depths from the cyclone separator as described in the Work Plan Addendum (Geomatrix, 2005b).

2.4 Sample Handling and Analysis

Soil samples were collected and placed in 4-oz. glass jars, labeled, placed in sealable bags, and stored in a cooler with ice. All samples were handled and transported under Geomatrix chain-of-custody procedures and sent by lab courier to Calscience Environmental Laboratory (Calscience), in Garden Grove, California for analysis using EPA Method 6850. Six of the soil samples analyzed for perchlorate using EPA Method 6850 were additionally analyzed for perchlorate using EPA Method 314.0 to evaluate the comparability of the two laboratory methods. When a soil sample was analyzed using both methods, the laboratory was instructed to use the same preparation sample for both analyses to eliminate variability resulting from heterogeneity of the soil. Analytical results for both methods indicate that the sampling results from the two methods are comparable.

2.5 Surveying

All borings were surveyed (vertical and horizontal) by Calvada Surveys, a licensed surveyor in the State of California, and referenced to mean sea level and the California State Plane Coordinate System. The survey was tied-in to the existing wells and borings previously surveyed at the Site. The survey data are provided in Appendix B.

2.6 Equipment Wash and Investigation Derived Waste

All downhole drilling equipment was steam-cleaned prior to use and between soil boring locations. The driller set up a decontamination station south of Building 2 and allowed the wash water to pond on Visqueen plastic and evaporate. Between soil sampling intervals, the sampling equipment was washed with a detergent-water solution, rinsed with potable water and then rinsed again with deionized water.

Soil cuttings and wastewater from decontamination activities generated during sampling activities were temporarily contained in roll-off bins. The roll-off bins were transported off site

by Belshire Environmental, Inc. to Waste Management's Kettleman Hills permitted waste disposal facility.

3.0 FIELD ASSESSMENT RESULTS

This section summarizes the results of the data collection activities described in the Second Work Plan Addendum and modifications documented in Table 1R and Figure 2R of Geomatrix January 31, 2007 letter to the LARWQCB. The following subsections describe lithologic logging, soil sampling results, an assessment of data quality, and an evaluation of the distribution of perchlorate in soils within the Study Area.

3.1 LITHOLOGIC LOGGING

Consistent with the results of prior lithologic logging within the AISA and the Study Area, sediments encountered during the drilling of the borings described in this Assessment Addendum indicated sediments comprised of zones of gravel, sand, and silt. Lithologic descriptions of soil and drill cuttings from the borings are presented on the boring logs in Appendix A. As expected given the depth to groundwater within the AISA, saturated conditions were not encountered in any of the borings which extended to a maximum total depth of 250 feet bgs.

3.2 SOIL SAMPLING RESULTS

A description and analytical results for soil samples collected during this phase of soil sampling activities is provided below. All soil samples submitted were analyzed for perchlorate using EPA Method 6850. Six of the soil samples analyzed for perchlorate by EPA Method 6850 were additionally analyzed for perchlorate using EPA Method 314.0 to evaluate the comparability of the two laboratory methods. Soil sample analytical results from March and April 2007 assessment in the Study Area are summarized in Table 3-1. The laboratory analytical reports and chain-of-custody forms for this assessment are provided in Appendix C. An oversized plate showing perchlorate concentrations in soil samples collected during this and previous assessments at each boring location is provided as Plate 1. A summary of findings from the March and April 2007 assessment is summarized below by the areas identified as data gaps in the Second Work Plan Addendum.

3.2.1 Horizontal Extent of Perchlorate in Area North of Building 3

This data gap was related to detections of perchlorate in boring PSZB-52 as high as 15,000 µg/kg at a depth of 2.5 feet bgs in soil samples collected in 2006. To address this data gap,

three borings were drilled to 40 feet bgs in this area to evaluate the horizontal extent of perchlorate in soil as shown on Figure 1-3. PSZB-74 was advanced approximately 50 feet north of PSZB-52; PSZB-75 was advanced approximately 70 feet northeast of PSZB-52; and PSZB-84 was advanced approximately 130 feet east of PSZB-52.

Soil analytical results from PSZB-74 indicated perchlorate concentrations ranging from 8.9 µg/kg to 32 µg/kg in the interval of 7.5 to 20 feet bgs. Perchlorate was not detected above the laboratory reporting limit of 6 µg/kg in samples collected at depths of 1, 2.5, and 5 feet bgs and in the interval from 25 to 40 feet bgs. Soil analytical results from PSZB-75 indicated perchlorate concentrations ranging from 6.6 µg/kg to 54 µg/kg in the interval of 5 to 40 feet bgs. Perchlorate was not detected above the laboratory reporting limit of 6 µg/kg in samples collected from boring PSZB-75 at depths of 1 and 2.5 feet bgs. With only one exception (54 µg/kg at 7.5 feet bgs), no soil samples collected from boring PSZB-75 at depths greater than 5 feet bgs had reported perchlorate concentrations greater than 40 µg/kg. Soil analytical results from PSZB-84 indicated perchlorate concentrations ranging from 13 µg/kg to 520 µg/kg from 1 to 40 feet bgs. The highest concentration of perchlorate was detected at a depth of 5 feet bgs in this boring. Perchlorate concentrations at the 35- and 40-foot sample in this boring were 270 and 250 µg/kg, respectively.

The horizontal extent of the occurrence of perchlorate in soils in the area north of Building 3 along Optical Drive appears to be adequately characterized by soil analytical results from borings to the north (PSZB-74) and northwest (PSZB-75). However, the eastern extent of perchlorate detected in soil samples from boring PSZB-84 has not been completely characterized.

3.2.2 Vertical Extent of Perchlorate in Area North of Building 3

This data gap was related to a perchlorate concentration of 120 µg/kg in the deepest sample (40 feet bgs) in PSZB-52 in soil samples collected in 2006. To address this data gap, one intermediate-zone boring, PIZB-7, was advanced adjacent to this boring to characterize the vertical extent of perchlorate in this area to a depth of 100 feet as shown on Figure 1-3 (soil sample collection began at 45 feet bgs).

Soil analytical results from PIZB-7 indicated perchlorate concentrations ranging from 25 µg/kg to 120 µg/kg in the interval of 45 to 100 feet bgs. Based on these results, the vertical extent of the occurrence of perchlorate in the area north of Building 3 has not been completely characterized.

3.2.3 Vertical Extent of Perchlorate Northeast of Building 2

This data gap is related to a perchlorate concentration of 880 µg/kg in the deepest sample (100 feet) from PIZB-01 in soil samples collected in 2006. To address this data gap, one deep-zone boring, PDZB-18, was advanced adjacent to this boring to characterize the vertical extent of perchlorate in this area (Figure 1-3). The boring was drilled to a depth of 250 feet and soil samples were collected from 110 feet bgs to total depth of the boring. Soil samples collected at depths greater than 200 feet bgs were placed on hold at the laboratory pending laboratory results of the shallower soil samples.

Soil analytical results from PDZB-18 indicated perchlorate concentrations ranging from 15 µg/kg to 140 µg/kg in the interval of 110 to 200 feet bgs. No soil samples collected from boring PDZB-18 at depths greater than 150 feet bgs had perchlorate concentrations greater than 40 µg/kg. Because perchlorate concentrations did not exceed 40 µg/kg from the interval of 150 to 200 feet bgs, the samples collected from 210 to 250 feet bgs were not analyzed. Based on these results, the vertical extent of perchlorate concentrations in soil samples collected in the area northeast of Building 2 is considered to be adequately characterized.

3.2.4 Vertical Extent of Low Concentrations of Perchlorate in Deeper Soils South of Building 4

This data gap is related to detectable concentrations of perchlorate in soil samples collected in 2006 near the bottom of boring PIZB-4A. A soil sample collected at the bottom of PIZB-4A at a depth of 100 feet did not indicate perchlorate in soil at concentrations at or above the laboratory reporting limit of 40 µg/kg, however, the sample immediately above this sample, collected at a depth of 90 feet, indicated a low concentration of perchlorate of 58 µg/kg. To address this data gap, one deep-zone boring, PDZB-19, was advanced adjacent to this boring to characterize the vertical extent of perchlorate in this area. The boring was drilled to a depth of 250 feet and soil samples were collected from 110 feet bgs to total depth of the boring. Soil samples collected at depths greater than 200 feet bgs were placed on hold at the laboratory pending laboratory results of the shallower soil samples.

Soil analytical results from PDZB-19 indicated perchlorate concentrations ranging from 21 µg/kg to 690 µg/kg in the interval of 100 to 250 feet bgs. Based on these results, the vertical extent of perchlorate soil concentrations in the area south of Building 4 appears to extend down to the historic high water level at the site.

3.2.5 Horizontal and Vertical Extent of Low Concentrations of Perchlorate in Shallow Soils South of Building 4

This data gap is related to low concentrations of perchlorate (ranging from 42 to 110 µg/kg) in soil samples collected in 2006 from near-surface soil borings PSZB-63, PSZB-72, and PSZB-73. To address this data gap, one shallow-zone boring, PSZB-76, was advanced adjacent to PSZB-73 to characterize the vertical extent of perchlorate at this location to a depth of 40 feet bgs (Figure 1-3). Four additional near-surface borings (PSZB-77, PSZB-78, PSZB-79, and PSZB-80) were completed using an air-knife to characterize the horizontal extent of perchlorate in shallow soils south of Building 4 (Figure 1-3).

Soil analytical results from PSZB-76 indicated perchlorate concentrations ranging from 14 µg/kg to 60 µg/kg in the interval of 7.5 to 20 feet bgs. Perchlorate was not detected above the laboratory reporting limit of 6 µg/kg in samples collected in the interval from 25 to 40 feet bgs. With only one exception (60 µg/kg at 7.5 feet bgs), no soil samples collected from boring PSZB-76 at depths greater than 10 feet bgs had perchlorate concentrations greater than 40 µg/kg. Soil analytical results from PSZB-77, PSZB-78, PSZB-79, and PSZB-80 indicated perchlorate concentrations ranging from non-detect (<6 µg/kg) to 220 µg/kg from 1 to 5 feet bgs. Analytical results from only one of these borings (PSZB-77) indicated concentrations at depths of 1 and 2.5 feet bgs (220 µg/kg and 89 µg/kg, respectively) that warranted additional vertical characterization and this boring was sampled at additional depths of 7.5 and 10 feet bgs (<6 µg/kg and 11 µg/kg, respectively).

Analytical results from soil samples collected in PSZB-77 and PSZB-78 indicated that additional lateral characterization was needed in shallow soils to the south in the Northrop Grumman parking lot. As shown on Figure 1-3, two additional near-surface shallow borings were added as step-out locations to the south of PSZB-77 and PSZB-78 (PSZB-86 and PSZB-85, respectively) and one was added to the west of PSZB-77 (PSZB-87). Soil analytical results from PSZB-85, PSZB-86, and PSZB-87 indicated perchlorate was not detected above the laboratory reporting limit of 6 µg/kg in samples collected in the interval from 1 to 5 feet bgs.

The horizontal limits of the occurrence of perchlorate in the area south of Building 4 in the Northrop Grumman parking lot appear to be defined by soil analytical results from borings PSZB-79, PSZB-80, PSZB-85, PSZB-86, and PSZB-87. Based on these results, the vertical extent of perchlorate in the area south of Building 4 in the Northrop Grumman parking lot is considered to be adequately characterized.

3.2.6 Characterization of Perchlorate in Soil in the Vicinity of the New Truck Well at Building 2

Construction work and sampling of the shallow soil near a truck well constructed east of Building 2 (Figure 1-3) in June and July 2006 indicated perchlorate in the soils sampled for waste characterization. Waste characterization samples indicated perchlorate was present in excavated soil at concentrations of up to 831 µg/kg. With the exception of one sidewall sample collected at a depth of approximately 3 feet bgs that contained 52 µg/kg perchlorate, confirmation samples collected in the sidewalls and bottom of the excavation, did not indicate the presence of perchlorate above the laboratory reporting limit of 40 µg/kg. Three shallow-zone borings, PSZB-81, PSZB-82, and PSZB-83, were advanced to the north, east, and southeast of the new truck well at Building 2 to characterize the vertical extent of perchlorate in this area to a depth of 40 feet bgs (Figure 1-3).

Soil analytical results from PSZB-81, PSZB-82, and PSZB-83 indicated perchlorate concentrations ranging from 7.1 µg/kg to 4,100 µg/kg in the interval of 1 to 40 feet bgs. No soil samples collected from boring PSZB-81 at depths greater than 20 feet bgs had perchlorate concentrations greater than 40 µg/kg. No soil samples collected from boring PSZB-82 or PSZB-83 or at depths greater than 15 feet bgs had perchlorate concentrations greater than 40 µg/kg. Concentrations exceeding 1,000 µg/kg only were detected in the 2.5-foot or shallow soil samples in borings PSZB-81 and PSZB-83.

The horizontal extent of perchlorate detected in shallow soil samples in the area of the new truck well at Building 2 appear to be adequately characterized. Similarly, the vertical extent (>20 feet bgs) of the occurrence of perchlorate in the area of the new truck well at Building 2 appear to be adequately characterized by soil analytical results from borings PSZB-81, PSZB-82, and PSZB-83.

3.3 Data Quality Assessment

The field quality assurance (QA) program was in conformance with Geomatrix field protocols and standard laboratory QC procedures. Laboratory reports for precision, accuracy, and/or surrogate recovery, generated by Calscience, are provided in the laboratory reports in Appendix C. A discussion of the field and laboratory QA program is provided below.

Field QC

A sample of the rinsate of distilled water poured over the steam cleaned drill casing was collected prior to drilling PDZB-19 and PSZB-81. Two rinsate samples were collected during

this drilling and sampling program (sample identification "EQB20070329", and "20070409-EB") were collected on March 29 and April 9, 2007, respectively. Analyses of these samples for perchlorate did not indicate the presence of perchlorate in the rinsate samples above the laboratory reporting limit of 3 µg/l (Table3-2). Laboratory analytical reports of the equipment rinse samples are provided in Appendix C.

Laboratory QA

The laboratory QA program included data package completeness, laboratory case narrative, chain-of-custody forms, analytical method holding time requirements, and an evaluation of surrogate recoveries, reagent and matrix spikes, matrix spike duplicates, and laboratory control samples (LCS). The QA program also consists of data validation performed by a qualified chemist in accordance with U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review, EPA/540/R-99/008 (U.S. EPA, 2002). This review included checking QC values provided on the laboratory QC forms to the method QC criteria.

All laboratory QC criteria were within acceptable limits with the following exceptions:

- The laboratory indicated MSD recovery was 49% (less than the control limit of 50-150%) in the MS/MSD performed with sample PDZB-19-190. The associated MS was within the control limits as was the associated LCS/LCSD. Sample results were not qualified.
- The MS/MSD recoveries were greater than the control limit of 80-120% at 124% in the MS/MSD performed using sample PSZB-81-2.5. Samples were analyzed using this method only to compare the results against the results obtained using Method 6850. The associated LCS/LCSD was within the control limits; therefore samples results were not qualified.
- The MS/MSD was not recovered in the MS/MSD performed using sample PSZB-83-2.5. The concentration of sample PSZB-83-2.5 was five times greater than the spike added, and the associated LCS/LCSD was within the control limits; therefore the sample results were not qualified.

3.4 DISTRIBUTION OF PERCHLORATE IN SOILS

The distribution of perchlorate in soil samples collected during the March and April 2007 soil sampling activities were evaluated using the same methodology presented in the April 18, 2006

Further Assessment Report. This methodology utilizes a three-dimensional geospatial modeling program, EarthVision®, to interpolate the lateral and vertical extent of observed perchlorate concentrations. Soil sampling results at each borehole location and discrete sampling depth were input into the EarthVision® software for interpolation of perchlorate concentrations in three-dimensions. Following the development of a three-dimensional representation of the distribution of residual perchlorate in soils using the EarthVision® software, various prospectives of the lateral and vertical extent of perchlorate were evaluated using all soil sampling results collected to date within the Study Area. The resulting interpolated perchlorate concentrations at depth intervals of 0 to 20 feet, 20 to 40 feet, and greater than 40 feet bgs are shown in plan view on Figures 3-1, 3-2, and 3-3. Each of these figures includes a three dimensional oblique angle view of the interpolated perchlorate distribution in lower left-hand corner of the figure. In addition, cross-sections showing the vertical extent of perchlorate along three cross-section alignments (A-A', B-B', and C-C' section line alignments shown on Figure 3-4) through the Study Area are shown on Figures 3-5 and Figure 3-6.

The evaluation of soil sampling results including the three-dimensional interpolation of the perchlorate concentrations using the EarthVision® software resulted in the following general conclusions regarding the lateral and vertical extent of perchlorate in the Study Area to concentrations of 40 µg/kg as requested in the LARWQCB letter dated January 3, 2007:

- With one exception, the lateral extent of perchlorate in the Study Area has been characterized to concentrations of 40 µg/kg. The exception is the area north of Building 3 where perchlorate was detected in soil at concentrations of up to 520-µg/kg.

- The vertical extent of perchlorate has been characterized to concentrations of 40 µg/kg at the northeast corner of Building 2, which was previously a data gap. The area north of Building 3, however, has not been characterized vertically to concentrations of 40 µg/kg. Perchlorate was detected in the intermediate boring PIZB-7 at 100 feet bgs at a concentration of 79 µg/kg and in boring PSZB-84 at 40 feet bgs at a concentration of 250 µg/kg.

- The vertical extent of perchlorate above concentrations of 40 µg/kg south of Building 4 appears to extend beyond a depth of 250 feet bgs and may reach groundwater in this area. The historic high groundwater level at the site (based on water level data from MW-4, the closest monitoring well to the Building 4 area) has been as high as about 270 feet bgs during periods of high groundwater levels such as those measured in 1993 and 1995.

- Consistent with observations in the April 18, 2006 Further Assessment Report, five areas of highest perchlorate concentrations ("hot spots") were observed in the upper 20 feet in the Study Area. These "hot spots" are located near: 1) the northeast corner of Building 2 extending to the northwest corner of Building 3; 2) the northeast corner of Building 4; 3) the northwest corner of Building 4 extending west and northwest to Building 2; 4) a localized areas west of the southwest corner of Building 4; and 5) localized areas south of Building 4. These "hot spot" locations are generally consistent with the current understanding of the former locations of Former Grinding Station 6, Former Mixing Station 8, and Former Mixing Station 9.

4.0 ADDITIONAL EVALUATION OF SOIL SCREENING LEVEL

This section describes the additional evaluation of a site-specific SSL for perchlorate in the upper 20 feet of the vadose zone within the Study Area. This additional evaluation was requested by the LARWQCB in a technical meeting on June 14, 2006 and was also requested in a letter to Aerojet dated January 3, 2007. The approach for the development of a site-specific SSL for the Study Area was described in the Further Assessment Report. This approach relies on conceptual and numerical models of vadose zone flow and perchlorate migration as described in detail in the Further Assessment Report. The approach for the development of the SSL presented in the Further Assessment Report and this Assessment Addendum focuses on the development of appropriate screening level for residual perchlorate in the upper 20 feet of the vadose zone that are protective of underlying groundwater. The development of the SSL for only upper 20 feet of vadose zone is considered appropriate because: 1) the highest concentrations of residual perchlorate are observed in the upper 20 feet of the vadose zone within the Study Area, and 2) 20 feet is considered the maximum practical depth for the remediation of soils containing perchlorate through excavation and disposal or ex-situ treatment (Alternatives C and D in the RAP). Importantly, the perchlorate SSL developed in the Further Assessment Report and in this Assessment Addendum is intended to be used as a preliminary soil screening level to guide characterization and remediation planning activities relative to the protection of groundwater. The perchlorate SSL is not intended to be used a remediation or cleanup goal for impacted soils because remediation or cleanup goals need to consider other factors such as existing land use, future land use, effectiveness, implementability, and cost.

4.1 Predicted Impacts to Groundwater

As described in detail in the Further Assessment Report, the VS2DT model was utilized to simulate potential impacts to groundwater from residual perchlorate concentrations in the upper

20 feet of vadose zone for the following two future land use scenarios. These future land use scenarios are consistent with those evaluated in the RAP using the VLEACH model.

- No infiltration – In this future land use scenario, residual perchlorate concentrations in soil are covered and remain covered by impermeable pavement. As a result, no infiltration or downward percolation of water occurs through the residual perchlorate concentrations in soil.

- Infiltration of precipitation – In this future land use scenario, residual perchlorate concentrations in soil are exposed to naturally occurring precipitation and infiltration (pavement is removed with the ground surface exposed). Approximately 15 percent (3 inches per year) of the annual average precipitation (20 inches per year) is allowed to infiltrate and percolate downward through the vadose zone. This estimated infiltration rate is based on groundwater modeling studies in the San Gabriel Basin that consider precipitation rates, surface runoff, and evapotranspiration rates. Infiltrating precipitation percolates downward through the residual perchlorate concentrations resulting in leaching and migration of perchlorate towards the water table.

The VS2DT model domain, source areas, and the location of the downgradient POC is shown on Figure 4-1. Perchlorate Source areas defined in the model were based on areas of observed perchlorate concentrations in the upper 20 feet of vadose zone as described in Section 3.2. No sources of perchlorate below 20 feet were simulated for the reasons described above in Section 4.0. Following the simulation of each of the future land use scenarios described above using relative source concentrations (C/Co = 1), the resultant predicted concentrations were used to estimate a soil concentration for perchlorate in the upper 20 feet of the vadose zone that would be equivalent to a groundwater concentration of 6 micrograms per liter (µg/l) at the POC. The 6 µg/l threshold concentration for this evaluation is based on the State of California Public Health Goal for perchlorate in drinking water.

Predicted perchlorate concentrations in groundwater at the POC are shown on Figures 4-2 and 4-3 for each of two land use scenarios described above. The soil concentration for perchlorate that is equivalent to a groundwater perchlorate concentration of 6 µg/l at the POC is also shown on these figures. For the no infiltration land use scenario, the simulated perchlorate concentrations were effectively zero for the entire duration of the simulation and therefore no predicted perchlorate concentrations are shown on Figure 4-2. This result is consistent with the concentrations previously predicted using the VLEACH model in the RAP (Geomatrix, 2002a). Simulated perchlorate concentrations for the infiltration of precipitation scenario shown on Figure 4-3 indicate that the peak concentrations are predicted to occur at the POC after

approximately 80 years. This demonstrates the very slow migration of perchlorate through the vadose zone under conditions consistent with the infiltration of normal precipitation.

4.2 Model Sensitivity and Uncertainty Analyses

Consistent with the VS2DT modeling results presented in the Further Assessment Report, the sensitivity of the VS2DT modeling results was evaluated by systematically adjusting various input parameters from the base case model input parameters listed in Table 4-1, to assess the change in soil perchlorate concentrations in the upper 20 feet of the vadose zone that would be equivalent to a groundwater concentration of 6 µg/l at the POC. The base case model input parameters presented in Table 4-1 are generally based on average or median values within a range of measured values. Consequently, the base case input parameters are considered to be the most representative of the site conditions being simulated. Sensitivity analyses typically adjust various input parameters from the base case parameters within the range of measured or reported values for the various input parameters. This approach not only allows for the assessment of the sensitivity of the model to changes in input parameters but also allows for an assessment of the effect that parameter uncertainties have on model results.

A tabulation of the various sensitivity simulations conducted for the VS2DT model described above is provided in Table 4-2. Sensitivity simulations were performed using the base case input parameters presented in Table 4-1 and infiltration rates associated with the infiltration of precipitation land use scenario described above. As stated above, adjustments to the various input parameters reflect uncertainties in the measured or reported values for the various model input parameters. Based on this evaluation, it was determined the VS2DT model is most sensitive to changes in saturated hydraulic conductivity, porosity, and infiltration rates. Conversely, the model was determined to be least sensitive to changes in residual moisture content, initial moisture content, and changes in longitudinal and transverse dispersivity values. The results of various model sensitivity simulations indicated that adjustments to the various input parameters over the range of measured or expected values resulted in simulated soil perchlorate concentrations ranging from 412 to 987 µg/kg in the upper 20 feet of the vadose zone that were equivalent to 6 µg/l in groundwater at the POC. By comparison, soil perchlorate concentrations of 677 µg/kg were predicted using the base case model input parameters. Consequently, the range of predicted soil concentrations of 412 to 987 µg/kg demonstrates the variability in model results associated with the uncertainties in measured or reported values for the various model input parameters.

4.3 Revised SSL for Perchlorate

The approach for the development of the SSL presented in this Assessment Addendum and the Further Assessment Report focuses on the development of an appropriate screening level for residual perchlorate in the upper 20 feet of the vadose zone that is protective of groundwater. Development of the SSL for only the upper 20 feet of vadose zone is considered appropriate because: 1) the highest concentrations of residual perchlorate are observed in the upper 20 feet of the vadose zone within the Study Area, 2) most of the residual perchlorate mass resides in the upper 20 feet of the vadose zone, and 3) 20 feet is considered the maximum practical depth for the remediation of soils containing perchlorate through excavation and ex-situ treatment. As stated in Section 4.0, no practical removal or treatment alternative exists for the deeper areas of perchlorate contamination within the AISA.

As demonstrated by the VS2DT modeling in this Assessment Addendum, the Further Assessment Report, and previous modeling efforts presented in the RAP, the installation of a relatively impermeable cap eliminates the need to apply a SSL because the soils containing residual perchlorate would be left in place and functionally isolated from both human exposure and groundwater. However, to evaluate other potential land use scenarios where existing buildings and pavement may be removed, VS2DT simulations were performed to assess potential impacts to groundwater associated with perchlorate in the upper 20 feet of the vadose zone. These simulations indicated that perchlorate concentrations below 677 µg/kg in the upper 20 feet of the vadose zone pose no threat to groundwater quality at the POC under a future land use that allows infiltration of naturally occurring rainfall. In consideration of these results and uncertainties in model input parameters described in Section 4.2, it is proposed that a SSL of 500 µg/kg be adopted for the upper 20 feet of the vadose zone assuming land use restrictions that preclude deep infiltration of precipitation and/or landscape irrigation. Given that it has been demonstrated in this report that a perchlorate concentration of 677 µg/kg in the upper 20 feet of the vadose zone poses no threat to groundwater quality at the POC at the water table below the Study Area, a SSL of 500 µg/kg provides an adequate safety factor to address uncertainties associated with model predictions and future land use.

5.0 CONCLUSIONS AND RECOMMENDATIONS

This addendum report presents the findings to address data gaps in the assessment of soils containing residual concentrations of perchlorate greater than 40 µg/kg in the Study Area. This report also presents the development of a revised perchlorate SSL for the shallow vadose zone (upper 20 feet) that is protective of underlying groundwater and has a POC at the groundwater

surface directly downgradient of unsaturated soils containing residual perchlorate.

Conclusions and recommendations regarding the further assessment of soils are as follows:

- With one exception, the lateral extent of perchlorate in the Study Area has been characterized to concentrations of 40 µg/kg. The exception is the area north of Building 3. Additional characterization of the lateral extent to perchlorate in soil is recommended to the north and east of PSZB-84.

- The vertical extent of perchlorate has been characterized to concentrations of 40 µg/kg at the northeast corner of Building 2, which was previously identified as a data gap. However, the vertical extent of perchlorate has not been fully characterized to concentrations of 40 µg/kg in the area north of Building 3. Consequently, additional vertical characterization is recommended to the north of Building 3.

- The vertical extent of perchlorate above concentrations of 40 µg/kg south of Building 4 appears to extend beyond a depth of 250 feet bgs and may reach groundwater in this area. The historic high groundwater level at the site (based on water level data from MW-4, the closest monitoring well to the Building 4 area) has been as high as about 270 feet bgs during periods of high groundwater levels such as those measured in 1993 and 1995.

- Consistent with the Further Assessment Report submitted in April 18, 2006, five areas of highest perchlorate concentrations ("hot spots") were observed in the upper 20 feet in the Study Area. These "hot spots" are located near: 1) the northeast corner of Building 2 and extending to the northwest corner of Building 3; 2) the northeast corner of Building 4; 3) the northwest corner of Building 4 extending west and northwest to Building 2; 4) a localized areas west of the southwest corner of Building 4; and 5) localized areas south of Building 4. These "hot spot" locations are generally consistent with the current understanding of the former locations of Former Grinding Station 6, Former Mixing Station 8, and Former Mixing Station 9.

- Soil samples from borings near the new truck well at the eastern side of Building 2 confirmed that shallow soils in this area have high concentrations of perchlorate which is consistent with the current understanding of the location of Former Mixing Station 8 and the findings from analyses of soil samples collected from the excavated soils, whereas, confirmation soil samples collected from the excavation sidewalls and bottom support the conclusion that perchlorate is present in shallow soils in this area.

Conclusions and recommendations regarding the development of a SSL for perchlorate are follows:

- As demonstrated by analyses presented in this Assessment Addendum, Further Assessment Report, and previous analyses presented in the RAP, the installation and

maintenance of a relatively impermeable cap eliminates the need to apply a SSL, because soils containing residual perchlorate would be left in place, but functionally isolated from both human exposure and groundwater. Consequently, capping with institutional controls remains the most effective, implementable, and economical remedy for soils containing residual concentrations of perchlorate. This conclusion is consistent with the RAP, RAP addenda, and subsequent correspondence with the LARWQCB. As a result, capping with institutional controls remains the recommended remedial alternative for soils containing residual perchlorate in the Study Area.

- The development of the SSL for the upper 20 feet of vadose zone is considered appropriate because: 1) the highest concentrations of residual perchlorate are observed in the upper 20 feet of the vadose zone within the Study Area, 2) most of the mass of perchlorate remaining in soil is contained in the upper 20 feet, and 3) 20 feet would essentially be considered the maximum practical depth for remediation of soils containing perchlorate through excavation and ex-situ treatment. No practical removal or treatment alternative exists for the deeper areas of perchlorate contamination within the AISA.

- Given that it has been demonstrated in this report that a perchlorate concentration of 677 µg/kg in the upper 20 feet of the vadose zone poses no threat to groundwater quality at below the site, a SSL of 500 µg/kg provides an adequate margin of safety to address uncertainties associated with model predictions and future land use restrictions. Consequently, it is recommended that a perchlorate SSL of 500 µg/kg be adopted for the upper 20 feet of soils containing residual concentrations of perchlorate.

- The SSL for perchlorate in the shallow vadose zone presented in this Assessment Addendum and the Further Assessment Report is intended to be used as a preliminary soil screening level, to guide characterization and remediation planning activities relative to the protection of groundwater. The perchlorate SSL is not intended to be used directly as a remediation or cleanup goal for soils containing residual concentrations of perchlorate because remediation or cleanup goals need to consider other factors such as existing land use, future land use, effectiveness, implementability, and cost.

6.0 REFERENCES

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TABLES

TABLE 3-1

SUMMARY OF ANALYTICAL RESULTS FOR PERCHLORATE IN SOIL SAMPLES MARCH AND APRIL 2007

AZUSA/IRWINDALE STUDY AREA

Azusa and Irwindale, California

Results reported in micrograms per kilogram (µg/kg)

Boring ID	Sample Date	Sample Depth (feet bgs[1])	Perchlorate	
			EPA 314	EPA 6850
PIZB-7	4/3/07	45	NA[2]	25
PIZB-7	4/3/07	50	NA	56
PIZB-7	4/3/07	60	NA	47
PIZB-7	4/3/07	70	NA	120
PIZB-7	4/3/07	80	NA	57
PIZB-7	4/3/07	90	NA	55
PIZB-7	4/3/07	100	NA	79
PDZB-18	3/27/07	110	[124][3]	130
PDZB-18	3/27/07	120	[44.5][3]	51
PDZB-18	3/27/07	130	NA	140
PDZB-18	3/27/07	140	NA	100
PDZB-18	3/27/07	150	NA	38
PDZB-18	3/28/07	160	NA	32
PDZB-18	3/28/07	170	NA	22
PDZB-18	3/29/07	180	NA	19
PDZB-18	3/29/07	190	NA	21
PDZB-18	3/29/07	200	NA	15
PDZB-18	3/29/07	210	NA	NA
PDZB-18	3/29/07	220	NA	NA
PDZB-18	3/29/07	230	NA	NA
PDZB-18	3/29/07	240	NA	NA
PDZB-18	3/29/07	250	NA	NA
PDZB-19	3/30/07	110	NA	71
PDZB-19	3/30/07	120	NA	21
PDZB-19	3/30/07	130	NA	160
PDZB-19	3/30/07	140	NA	86
PDZB-19	3/30/07	150	NA	51
PDZB-19	3/30/07	160	NA	69
PDZB-19	3/30/07	170	NA	180
PDZB-19	3/30/07	180	NA	150
PDZB-19	3/30/07	190	NA	190
PDZB-19	3/30/07	200	NA	140
PDZB-19	3/30/07	210	[250][3]	240
PDZB-19	3/30/07	220	NA	260
PDZB-19	3/30/07	230	NA	320
PDZB-19	3/30/07	240	NA	690
PDZB-19	3/30/07	250	NA	510
PSZB-74	3/29/07	1	NA	ND (<6)[4]
PSZB-74	3/29/07	2.5	NA	ND (<6)
PSZB-74	3/29/07	5	NA	ND (<6)

TABLE 3-1

SUMMARY OF ANALYTICAL RESULTS FOR PERCHLORATE IN SOIL SAMPLES MARCH AND APRIL 2007

Results reported in micrograms per kilogram (µg/kg)

Boring ID	Sample Date	Sample Depth (feet bgs[1])	Perchlorate	
			EPA 314	EPA 6850
PSZB-74	4/11/07	7.5	NA	32
PSZB-74	4/11/07	10	NA	30
PSZB-74	4/11/07	15	NA	8.9
PSZB-74	4/11/07	20	NA	12
PSZB-74	4/11/07	25	NA	ND (<6)
PSZB-74	4/11/07	30	NA	ND (<6)
PSZB-74	4/11/07	35	NA	ND (<6)
PSZB-74	4/11/07	40	NA	ND (<6)
PSZB-75	3/29/07	1	NA	ND (<6)
PSZB-75	3/29/07	2.5	NA	ND (<6)
PSZB-75	3/29/07	5	NA	10
PSZB-75	4/11/07	7.5	NA	54
PSZB-75	4/11/07	10	NA	13
PSZB-75	4/11/07	15	NA	8.4
PSZB-75	4/11/07	20	NA	11
PSZB-75	4/11/07	25	NA	16
PSZB-75	4/11/07	30	NA	12
PSZB-75	4/11/07	35	NA	6.6
PSZB-75	4/11/07	40	NA	11
PSZB-76	4/12/07	7.5	NA	60
PSZB-76	4/12/07	10	NA	31
PSZB-76	4/12/07	15	NA	16
PSZB-76	4/12/07	20	NA	14
PSZB-76	4/12/07	25	NA	ND (<6)
PSZB-76	4/12/07	30	NA	ND (<6)
PSZB-76	4/12/07	35	NA	ND (<6)
PSZB-76	4/12/07	40	NA	ND (<6)
PSZB-77	3/30/07	1	NA	220
PSZB-77	3/30/07	2.5	NA	89
PSZB-77	3/30/07	5	NA	14
PSZB-77	4/12/07	7.5	NA	ND (<6)
PSZB-77	4/12/07	10	NA	11
PSZB-78	3/30/07	1	NA	110
PSZB-78	3/30/07	2.5	NA	7.6
PSZB-78	3/30/07	5	NA	ND (<6)
PSZB-79	3/28/07	1	NA	6.5
PSZB-79	3/28/07	2.5	NA	23
PSZB-79	3/28/07	5	NA	ND (<6)
PSZB-80	3/28/07	1	NA	ND (<6)
PSZB-80	3/28/07	2.5	NA	ND (<6)
PSZB-80	3/28/07	5	NA	ND (<6)
PSZB-81	4/2/07	1	NA	1,700
PSZB-81	4/2/07	2.5	[3,750][3]	4,100
PSZB-81	4/2/07	5	NA	100
PSZB-81	4/9/07	7.5	NA	140
PSZB-81	4/9/07	10	NA	44
PSZB-81	4/9/07	15	NA	58

TABLE 3-1

SUMMARY OF ANALYTICAL RESULTS FOR PERCHLORATE IN SOIL SAMPLES MARCH AND APRIL 2007

Results reported in micrograms per kilogram (µg/kg)

Boring ID	Sample Date	Sample Depth (feet bgs[1])	Perchlorate	
			EPA 314	EPA 6850
PSZB-81	4/9/07	20	NA	24
PSZB-81	4/9/07	25	NA	11
PSZB-81	4/9/07	30	NA	19
PSZB-81	4/9/07	35	NA	17
PSZB-81	4/9/07	40	NA	18
PSZB-82	4/2/07	1	NA	290
PSZB-82	4/2/07	2.5	[326][3]	340
PSZB-82	4/2/07	5	NA	74
PSZB-82	4/9/07	7.5	NA	90
PSZB-82	4/9/07	10	NA	110
PSZB-82	4/9/07	15	NA	17
PSZB-82	4/9/07	20	NA	25
PSZB-82	4/9/07	25	NA	8.4
PSZB-82	4/9/07	30	NA	12
PSZB-82	4/9/07	35	NA	20
PSZB-82	4/9/07	40	NA	20
PSZB-83	4/2/07	1	NA	870
PSZB-83	4/2/07	2.5	[1,970][3]	2,300
PSZB-83	4/2/07	5	NA	320
PSZB-83	4/10/07	7.5	NA	270
PSZB-83	4/10/07	10	NA	71
PSZB-83	4/10/07	15	NA	19
PSZB-83	4/10/07	20	NA	13
PSZB-83	4/10/07	25	NA	16
PSZB-83	4/10/07	30	NA	16
PSZB-83	4/10/07	35	NA	14
PSZB-83	4/10/07	40	NA	7.1
PSZB-84	4/10/07	1	NA	66
PSZB-84	4/10/07	2.5	NA	140
PSZB-84	4/10/07	5	NA	520
PSZB-84	4/10/07	7.5	NA	13
PSZB-84	4/10/07	10	NA	18
PSZB-84	4/10/07	15	NA	68
PSZB-84	4/10/07	20	NA	62
PSZB-84	4/10/07	25	NA	70
PSZB-84	4/10/07	30	NA	62
PSZB-84	4/10/07	35	NA	270
PSZB-84	4/10/07	40	NA	250
PSZB-85	4/20/07	1	ND (<20)*[5]	ND (<6)
PSZB-85	4/20/07	2.5	ND (<20)*	ND (<6)
PSZB-85	4/20/07	5	ND (<20)*	ND (<6)
PSZB-86	4/20/07	1	ND (<20)*	ND (<6)
PSZB-86	4/20/07	2.5	ND (<20)*	ND (<6)
PSZB-86	4/20/07	5	ND (<20)*	ND (<6)

TABLE 3-1

SUMMARY OF ANALYTICAL RESULTS FOR PERCHLORATE IN SOIL SAMPLES MARCH AND APRIL 2007

Results reported in micrograms per kilogram (µg/kg)

Boring ID	Sample Date	Sample Depth (feet bgs[1])	Perchlorate	
			EPA 314	EPA 6850
PSZB-87	4/20/07	1	ND (<20)*	ND (<6)
PSZB-87	4/20/07	2.5	ND (<20)*	ND (<6)
PSZB-87	4/20/07	5	ND (<20)*	ND (<6)

Notes:

1. Bgs = below ground surface.
2. NA = Sample collected but not analyzed or not analyzed using method identified in column heading.
3. Results in bracket analyzed using EPA Method 314.0 MOD using the same preparation aliquot used analyses using EPA Method 6850.
4. ND (<6) = Not detected above laboratory reporting limit indicated in parenthesis.
5. * = Perchlorate analyses using EPA Method 314 for samples from borings PSZB-85, PSZB-86 and PSZB-87 provided by the laboratory as screening level until it repaired the laboratory equipment for analyses using EPA Method 6850.

TABLE 3-2

SUMMARY OF ANALYTICAL RESULTS FOR QA/QC SAMPLES MARCH AND APRIL 2007

AZUSA/IRWINDALE STUDY AREA

Azusa and Irwindale, California

Results reported in micrograms per liter (µg/l)

Sample ID	Sample Date	QA/QC Sample Type	EPA Method 314.0
			Perchlorate
EQB20070329	4/2/07	Equipment Rinse Blank - Drill Casing	ND (<3)
20070409-EB	4/9/07	Equipment Rinse Blank - Drill Casing	ND (<3)

1. ND (<3) = Not detected above laboratory reporting limit indicated in brackets.

TABLE 4-1
VS2DT INPUT PARAMETERS
AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Base Case Input Parameter	Value
Horizontal Saturated Hydraulic Conductivity	350 feet per day (ft/day)
Hydraulic Conductivity Vertical Anisotropy	10:1
Initial Moisture Content	5%
Vadose Zone Porosity	23%
Effective Saturated Zone Porosity	10%
Ambient Infiltration from Precipitation	3 inches per year (in/year)
Van Genuchten Parameters	
Alpha	2.59
Beta	1.35
Residual Moisture Content	3%
Longitudinal Dispersivity	20 feet
Ratio of Longitudinal:Transverse Dispersivity	10

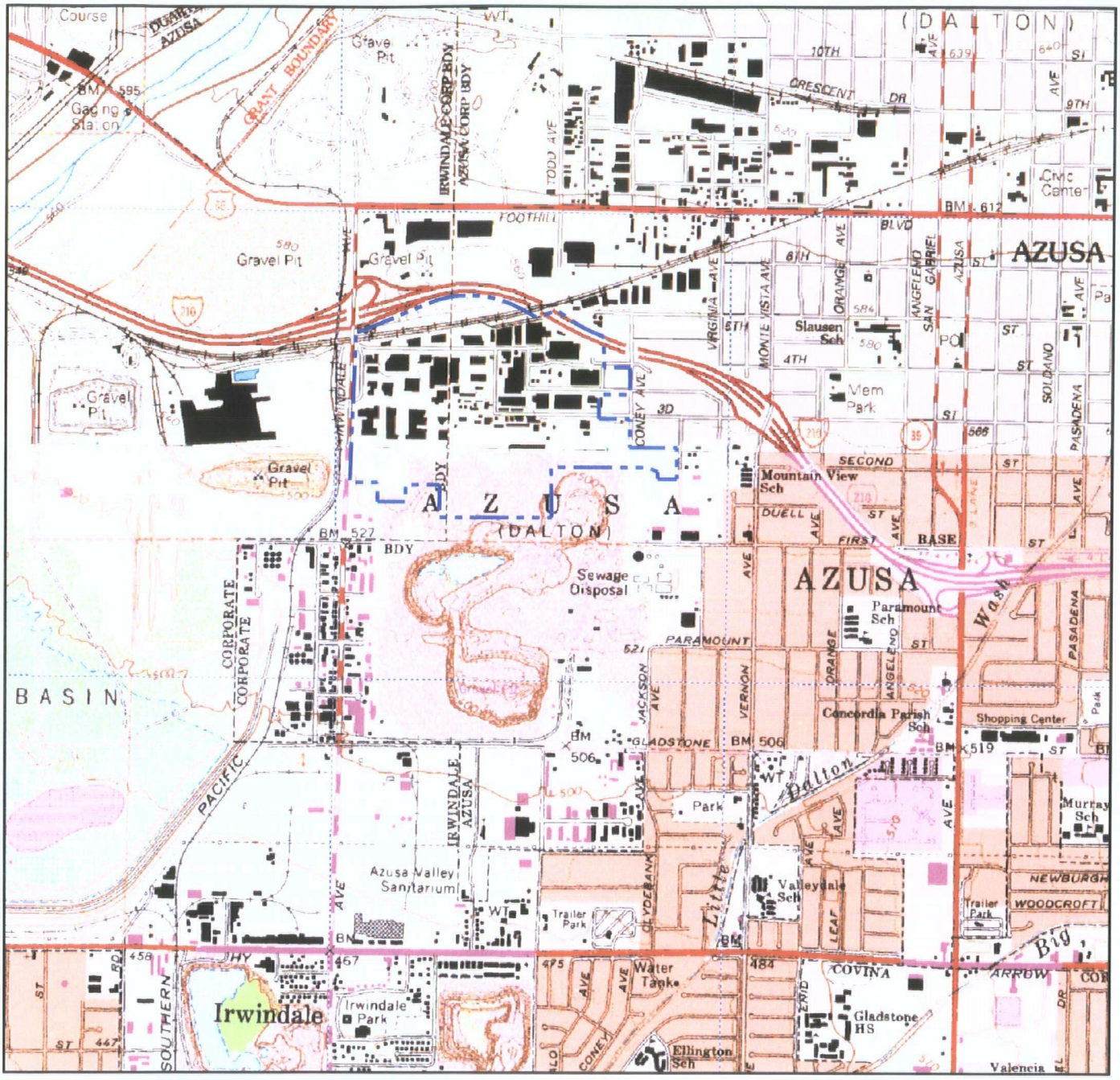
Geomatrix

TABLE 4-2
VS2DT SENSITIVITY SIMULATIONS
AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Input Parameter	Value	Peak Soil Concentration based on Groundwater Concentration of 6 ug/L at Water Table (ug/Kg)	Percent Change (%)	Time of Peak Concentration at Water Table (years)	Percent Change (%)
Saturated Hydraulic Conductivity					
Ksat - Increase	**450 ft/day**	855	26.34%	78	-2.39%
Ksat - Base Case	**350 ft/day**	677	0.00%	80	0.00%
Ksat - Decrease	**275 ft/day**	541	-20.10%	82	2.36%
Residual Moisture Content					
RMC - Increase	**4%**	709	4.81%	86	6.89%
RMC - Base Case	**3%**	677	0.00%	80	0.00%
RMC - Decrease	**1%**	607	-10.23%	69	-13.46%
Initial Moisture Content					
Initial Vw - Increase	**10%**	711	5.10%	73	-8.59%
Initial Vw - Base Case	**5%**	677	0.00%	80	0.00%
Initial Vw - Decrease	**4%**	645	-4.69%	82	2.60%
Vadose Zone Porosity					
Porosity - Increase	**28%**	770	13.86%	96	19.97%
Porosity - Base Case	**23%**	677	0.00%	80	0.00%
Porosity - Decrease	**17%**	551	-18.60%	61	-23.84%
Ambient Infiltration from Precipitation					
Infiltration Rate - Increase	**4 in/year**	518	-23.47%	62	-22.88%
Infiltration Rate - Base Case	**3 in/year**	677	0.00%	80	0.00%
Infiltration Rate - Decrease	**2 in/year**	987	45.83%	116	44.34%
Longitudinal Dispersivity					
αL - Increase	**30 feet**	832	22.98%	72	-10.20%
αL - Base Case	**20 feet**	677	0.00%	80	0.00%
αL - Decrease	**10 feet**	412	-39.11%	90	12.37%
Ratio of Longitudinal:Transverse Dispersivity					
αL/αT - Increase	**20**	495	-26.78%	80	0.24%
αL/αT - Base Case	**10**	677	0.00%	80	0.00%
αL/αT - Decrease	**5**	902	33.35%	80	-0.18%

Notes:
Ksat - saturated hydraulic conductivity
RMC - residual moisture content
αL - longitudinal dispersivity
αT - transverse dispersivity

FIGURES



Explanation

Expanded boundary of Azusa/Irwindale Study Area (AISA)

0 1000 2000

Approximate scale in feet

Base map modified from U.S.G.S. 7.5 minute quadrangle maps AZUSA, California 1995, and BALDWIN PARK, California 1966; Photo Revised 1981.

SITE LOCATION MAP

ASUZA / IRWINDALE STUDY AREA

Azusa and Irwindale, California

By: jrw	Date: 5/31/07	Project No. 7190.006
Geomatrix		Figure 1

Plot Date: 05/30/07 - 3:16 Plotted by: jworker
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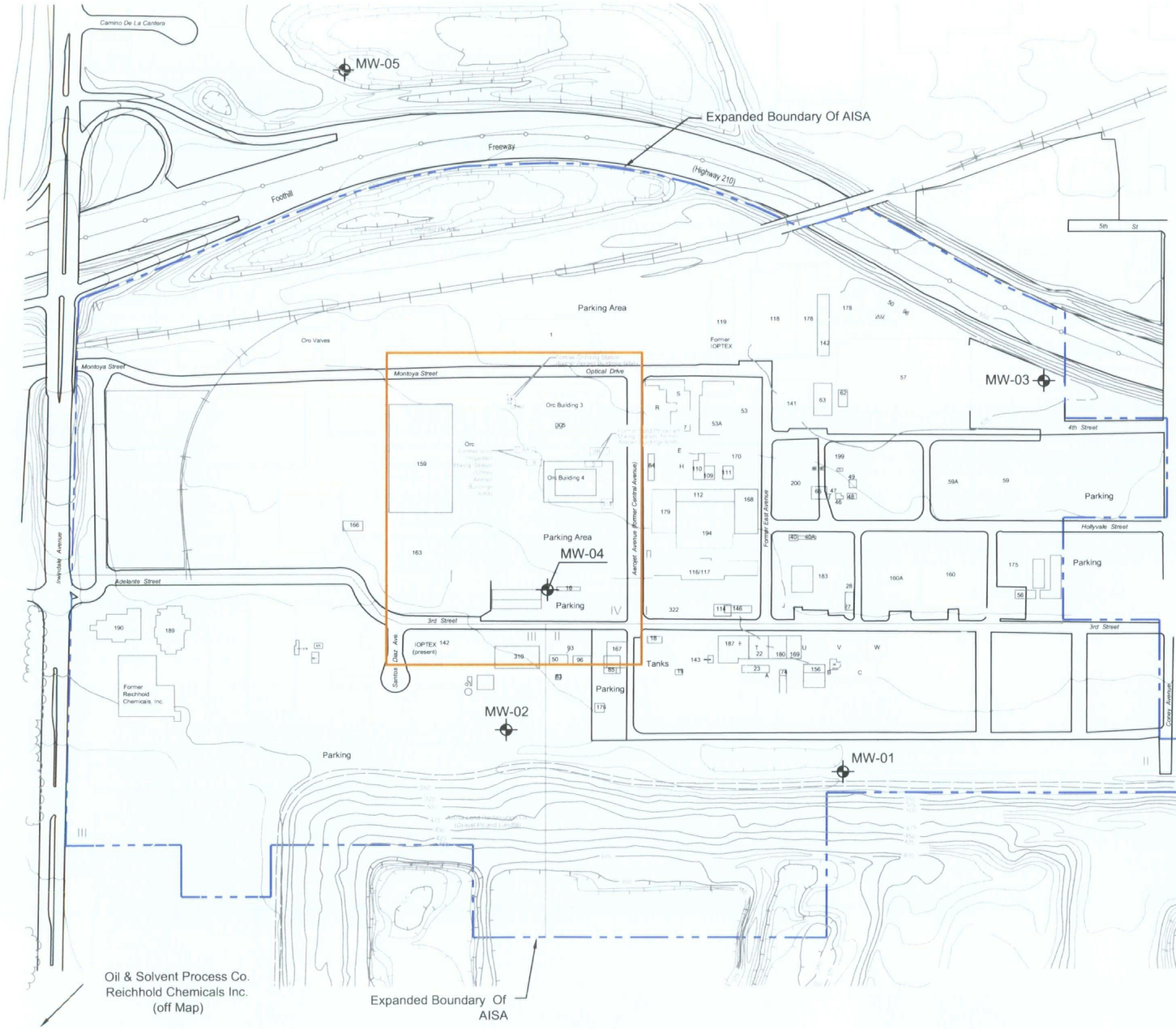
American Cyanamid Huffy
Manufacturing Corp. (off Map)



Explanation

- MW-05 — Groundwater monitoring well
- 142 — Former building location (with building number)
- 118 — Current building location (with building number)
- AISA — Azusa/irwindale study area
- Expanded boundary of AISA
- Study area

Note:

All locations are approximate.

N

0 200 400

Approximate scale in feet

Basemap modified from Harding ESE, dated 2001.

STUDY AREA WITHIN THE AISA

ASUZA / IRWINDALE STUDY AREA
Azusa and Irwindale, California

By: jrw	Date: 5/31/07	Project No. 7190.006
Geomatrix		Figure 1-2

Plot Date: 05/30/07 pm, Plotted by: jworker
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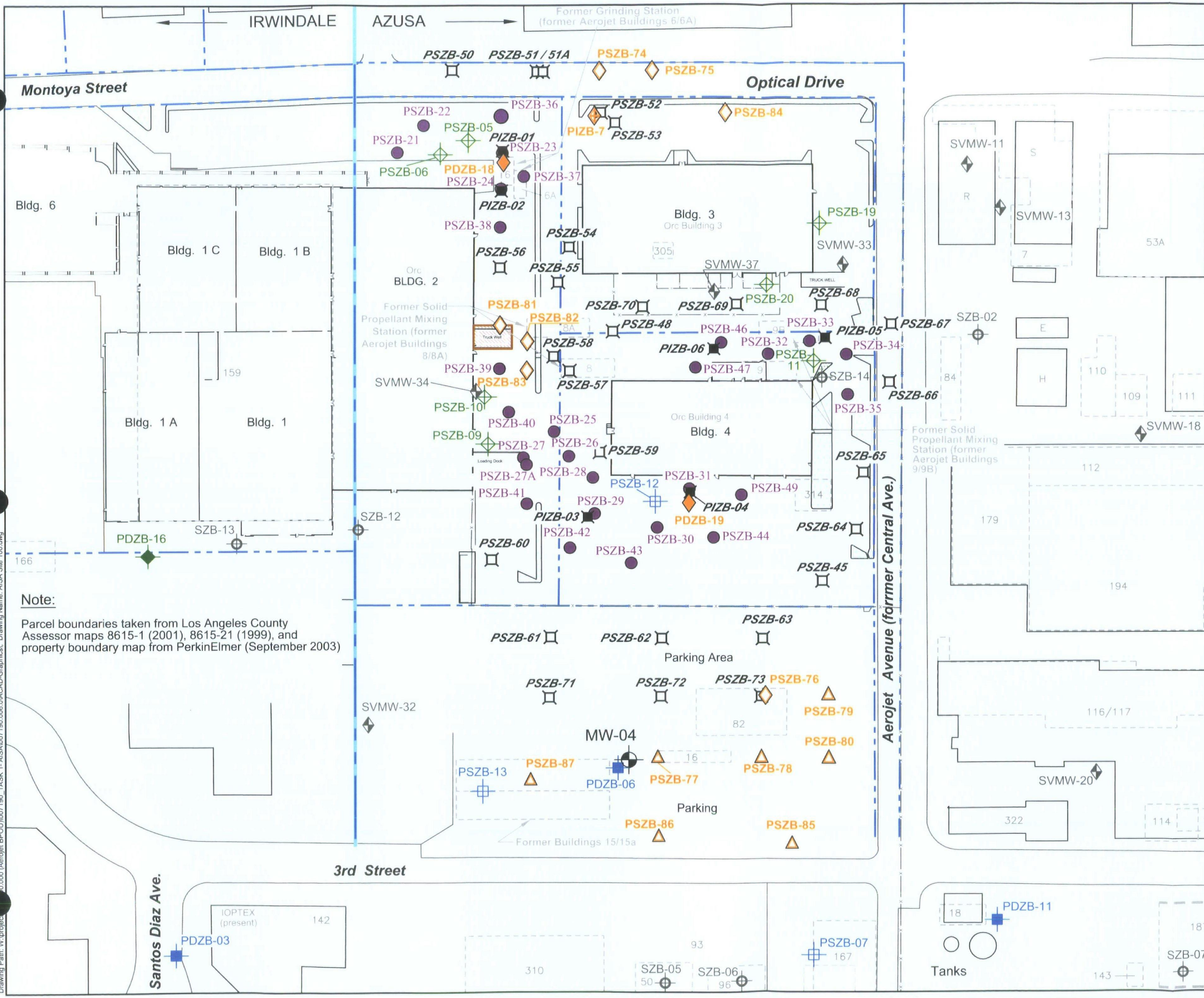
IRWINDALE
AZUSA
Former Grinding Station (former Aerojet Buildings 6/6A)
Montoya Street
Optical Drive
PSZB-50
PSZB-51 / 51A
PSZB-74
PSZB-75
PSZB-36
PSZB-22
PSZB-21
PSZB-05
PSZB-06
PIZB-01
PSZB-23
PDZB-18
PSZB-24
PSZB-37
PIZB-02
PIZB-7
PSZB-52
PSZB-53
PSZB-84
Bldg. 6
Bldg. 1 C
Bldg. 1 B
Bldg. 1 A
Bldg. 1
Orc BLDG. 2
Bldg. 3
Orc Building 3
305
Orc Building 4
Bldg. 4
159
PSZB-38
PSZB-56
PSZB-54
PSZB-55
PSZB-19
SVMW-33
SVMW-37
TRUCK WELL
PSZB-20
PSZB-68
PSZB-69
PSZB-70
Former Solid Propellant Mixing Station (former Aerojet Buildings 8/8A)
PSZB-81
PSZB-82
8A
PSZB-48
PSZB-46
PSZB-33
PIZB-05
PSZB-67
PSZB-58
PIZB-06
PSZB-32
PSZB-11
PSZB-34
PSZB-39
PSZB-83
PSZB-57
PSZB-47
SZB-14
PSZB-66
SVMW-34
PSZB-10
PSZB-35
PSZB-40
PSZB-25
PSZB-09
PSZB-27
PSZB-26
PSZB-59
Loading Dock
PSZB-27A
PSZB-28
PSZB-12
PSZB-31
PSZB-49
314
PSZB-65
PSZB-41
PSZB-29
PIZB-04
PIZB-03
PDZB-19
PSZB-42
PSZB-30
PSZB-44
PSZB-64
PSZB-43
PSZB-60
PSZB-45
SZB-12
SZB-13
PDZB-16
166
Note:
Parcel boundaries taken from Los Angeles County Assessor maps 8615-1 (2001), 8615-21 (1999), and property boundary map from PerkinElmer (September 2003)
PSZB-61
PSZB-62
PSZB-63
Parking Area
PSZB-71
PSZB-72
PSZB-73
PSZB-76
PSZB-79
82
SVMW-32
MW-04
PSZB-80
PSZB-87
16
PSZB-78
PSZB-13
PDZB-06
PSZB-77
Parking
PSZB-86
PSZB-85
Former Buildings 15/15a
Aerojet Avenue (former Central Ave.)
3rd Street
Santos Diaz Ave.
IOPTEX (present)
142
PDZB-03
310
93
SZB-05
50
SZB-06
96
PSZB-07
167
18
PDZB-11
Tanks
143
187
SZB-07
SVMW-11
S
R
SVMW-13
7
53A
SZB-02
E
H
84
110
109
111
SVMW-18
Former Solid Propellant Mixing Station (former Aerojet Buildings 9/9B)
112
179
194
116/117
SVMW-20
322
114

Explanation

PSZB-87 △	Near surface (5'-10') boring (Geomatrix, March/April 2007)
PSZB-84 ◇	Shallow zone (30'-40') boring (Geomatrix, March/April 2007)
PIZB-7	Intermediate zone (100') boring (Geomatrix, April 2007)
PDZB-19	Deep zone (250') boring (Geomatrix, March 2007)
PSZB-73	Shallow zone boring (Geomatrix, February/March 2006)
PIZB-06	Intermediate zone boring (Geomatrix, February/March 2006)
PSZB-49	Shallow zone boring (March/April 2005)
PSZB-20	Shallow zone boring (Phase II - Harding ESE, April 2001)
PDZB-16	Deep zone boring (Phase II - Harding ESE, April 2001)
PSZB-12	Shallow zone boring (Phase I - HLA, October 2000)
PDZB-06	Deep zone boring (Phase I - HLA, October 2000)
SZB-20	Shallow zone boring (HLA, 1994)
SVMW-37	Shallow vapor monitoring well (HLA, 1994)
MW-04	Monitoring well
	Current building
9	Former building
	Chain link fence
	Parcel boundary
	Irwindale-Azusa boundary
	Building 2 truck well excavation

0 50 100
Approximate scale in feet

Basemap modified from a Harding-ESE figure, revised 4/01, and a map provided by PerkinElmer, Optoelectronics, Inc., dated July, 2003. 2005, 2006 2007 boring locations based on Cal Vada surveys of April 2005, February-March 2006, and April 2007.

STUDY AREA SITE MAP SHOWING BORINGS AND WELLS

ASUZA / IRWINDALE STUDY AREA
Azusa and Irwindale, California

By: jrw	Date: 5/31/07	Project No. 7190.006
Geomatrix		Figure 1-3

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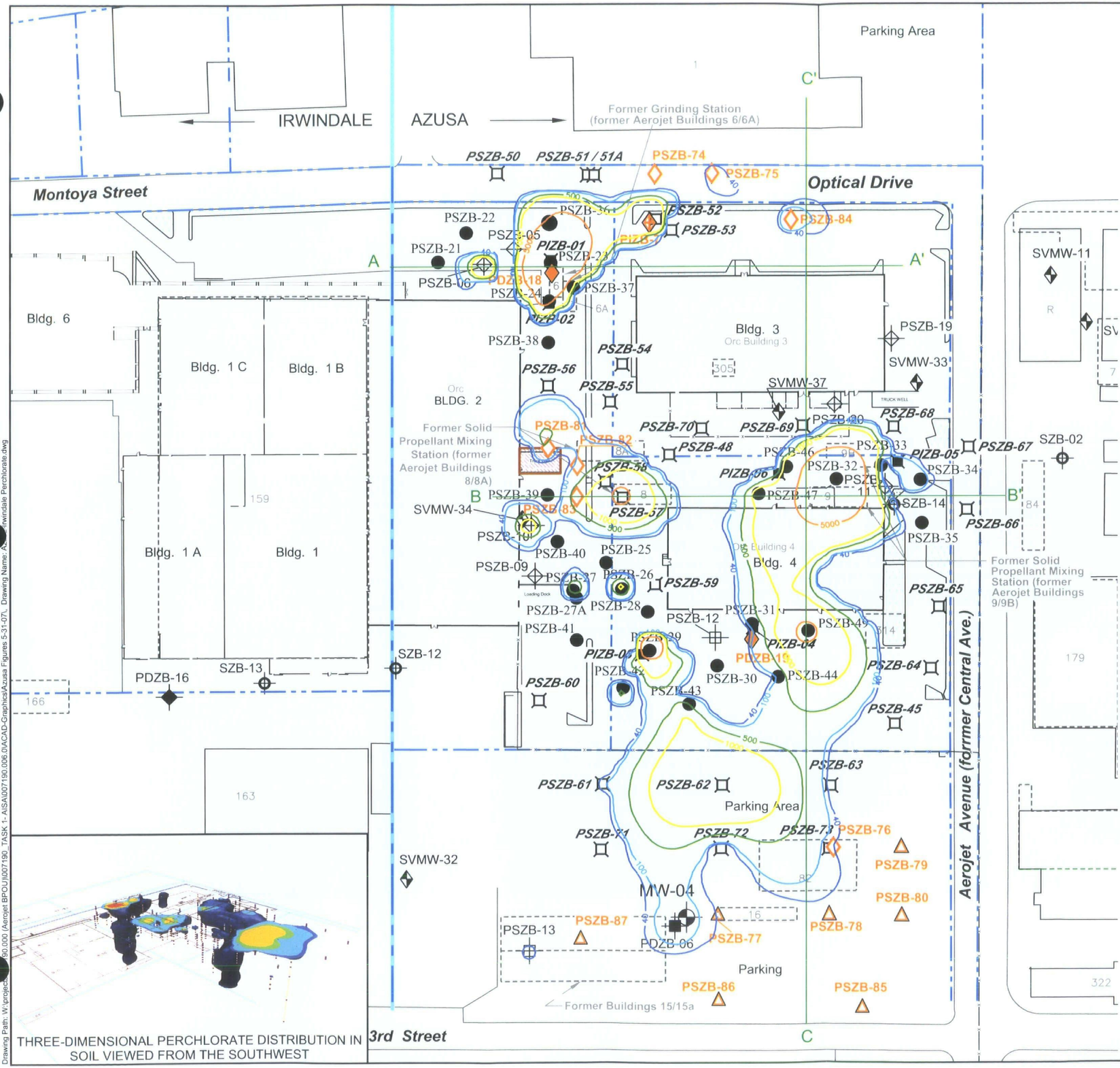

Explanation

- PSZB-49 — Shallow zone boring (Geomatrix, March-April 2005)
- PIZB-06 — Intermediate zone boring (Geomatrix, February-March 2006)
- PSZB-73 — Shallow zone boring (Geomatrix, February-March 2006)
- PSZB-12 — Shallow zone boring (Phase I - HLA, October 2000)
- PSZB-20 — Shallow zone boring (Phase II - Harding ESE, April 2001)
- PDZB-16 — Deep zone boring (Phase II - Harding ESE, April 2001)
- SZB-20 — Shallow zone boring (HLA, 1994)
- SVMW-37 — Vadose monitoring well (HLA, 1994)
- PSZB-87 — Near surface (5'-10') boring (Geomatrix, March/April 2007)
- PSZB-84 — Shallow zone (30'-40') boring (Geomatrix, March/April 2007)
- PIZB-7 — Intermediate zone (100') boring (Geomatrix, April 2007)
- PDZB-19 — Deep zone (250') boring (Geomatrix, March 2007)
- MW-04 — Groundwater monitoring well (HLA, 1993)

- 9 — Former building
- Current building
- Parcel boundary
- Irwindale-Azusa boundary
- 40 — Perchlorate Isoconcentration Contour (40 ug/kg)
- 100 — Perchlorate Isoconcentration Contour (100 ug/kg)
- 500 — Perchlorate Isoconcentration Contour (500 ug/kg)
- 1000 — Perchlorate Isoconcentration Contour (1000 ug/kg)
- 5000 — Perchlorate Isoconcentration Contour (5000 ug/kg)
- A — A' Section Location(s)

NOTE:
THE ISOCONCENTRATION CONTOURS SHOWN ON THE VARIOUS VIEWS REPRESENT INTERPOLATED APPROXIMATIONS OF THE DISTRIBUTION OF PERCHLORATE IN SOIL BASED ON AVAILABLE DATA.

N

0 50 100

Approximate scale in feet

Basemap modified from a map provided by PerkinElmer, dated July, 2003, Cal Vada surveys of April 2005, and February/March of 2006, and Los Angeles County Assessor parcel boundary maps.

DISTRIBUTION OF PERCHLORATE ABOVE 20 FEET BGS

ASUZA / IRWINDALE STUDY AREA
Azusa and Irwindale, California

By: jrw/ld	Date: 5/31/07	Project No. 7190.006
Geomatrix		Figure 3-1

IRWINDALE

AZUSA

Parking Area

Former Grinding Station (former Aerojet Buildings 6/6A)

Montoya Street

Optical Drive

Bldg. 6

Bldg. 1 C

Bldg. 1 B

Bldg. 1 A

Bldg. 1

Bldg. 3

Orc Building 3

Orc BLDG. 2

Bldg. 4

Orc Building 4

Former Solid Propellant Mixing Station (former Aerojet Buildings 8/8A)

Former Solid Propellant Mixing Station (former Aerojet Buildings 9/9B)

Former Buildings 15/15a

Parking Area

Parking

Aerojet Avenue (former Central Ave.)

3rd Street

PSZB-49 PSZB-50 PSZB-51 / 51A PSZB-74 PSZB-75 PSZB-52 PSZB-53 PSZB-84 PIZB-7 PSZB-22 PSZB-36 PSZB-05 PIZB-01 PSZB-21 PSZB-23 PSZB-06 PDZB-19 PSZB-24 PSZB-37 PIZB-02 PSZB-38 PSZB-54 PSZB-56 PSZB-55 PSZB-19 SVMW-33 SVMW-37 PSZB-68 PSZB-81 PSZB-82 PSZB-70 PSZB-69 PSZB-20 PSZB-48 PSZB-46 PSZB-33 PIZB-05 PSZB-67 SZB-02 PSZB-58 PIZB-06 PSZB-32 PSZB-34 PSZB-39 PSZB-83 PSZB-57 PSZB-47 SZB-14 PSZB-66 SVMW-34 PSZB-10 PSZB-35 PSZB-40 PSZB-25 PSZB-09 PSZB-27 PSZB-26 PSZB-59 PSZB-65 PSZB-27A PSZB-28 PSZB-12 PSZB-31 PSZB-49 PSZB-41 PSZB-29 PIZB-04 PIZB-03 PDZB-19 PSZB-64 PSZB-42 PSZB-30 PSZB-44 PSZB-60 PSZB-43 PSZB-45 PSZB-63 PSZB-61 PSZB-62 PSZB-71 PSZB-72 PSZB-73 PSZB-76 PSZB-79 PSZB-80 PSZB-78 PSZB-87 PSZB-77 PSZB-13 PDZB-06 PSZB-86 PSZB-85 SVMW-32 MW-04 SVMW-11 SZB-12 SZB-13 PDZB-16

A A' B B' C C'

THREE-DIMENSIONAL PERCHLORATE DISTRIBUTION IN SOIL VIEWED FROM THE SOUTHWEST

Explanation

- PSZB-49 — Shallow zone boring (Geomatrix, March-April 2005)
- PIZB-06 — Intermediate zone boring (Geomatrix, February-March 2006)
- PSZB-73 — Shallow zone boring (Geomatrix, February-March 2006)
- PSZB-12 — Shallow zone boring (Phase I - HLA, October 2000)
- PSZB-20 — Shallow zone boring (Phase II - Harding ESE, April 2001)
- PDZB-16 — Deep zone boring (Phase II - Harding ESE, April 2001)
- SZB-20 — Shallow zone boring (HLA, 1994)
- SVMW-37 — Vadose monitoring well (HLA, 1994)
- PSZB-87 — Near surface (5'-10') boring (Geomatrix, March/April 2007)
- PSZB-84 — Shallow zone (30'-40') boring (Geomatrix, March/April 2007)
- PIZB-7 — Intermediate zone (100') boring (Geomatrix, April 2007)
- PDZB-19 — Deep zone (250') boring (Geomatrix, March 2007)
- MW-04 — Groundwater monitoring well (HLA, 1993)

- Former building
- Current building
- Parcel boundary
- Irwindale-Azusa boundary
- 40 — Perchlorate Isoconcentration Contour (40 ug/kg)
- 100 — Perchlorate Isoconcentration Contour (100 ug/kg)
- 500 — Perchlorate Isoconcentration Contour (500 ug/kg)
- 1000 — Perchlorate Isoconcentration Contour (1000 ug/kg)
- A A' Section Location(s)

NOTE:
THE ISOCONCENTRATION CONTOURS SHOWN ON THE VARIOUS VIEWS REPRESENT INTERPOLATED APPROXIMATIONS OF THE DISTRIBUTION OF PERCHLORATE IN SOIL BASED ON AVAILABLE DATA.

0 50 100
Approximate scale in feet

Basemap modified from a map provided by PerkinElmer, dated July, 2003, Cal Vada surveys of April 2005, and February/March of 2006, and Los Angeles County Assessor parcel boundary maps.

DISTRIBUTION OF PERCHLORATE BETWEEN 20 FEET AND 40 FEET BGS

ASUZA / IRWINDALE STUDY AREA
Azusa and Irwindale, California

By: jrw/ld	Date: 5/31/07	Project No. 7190.006
Geomatrix		Figure 3-2

Plot Date: 05/31/07 - Plotted by: jworker
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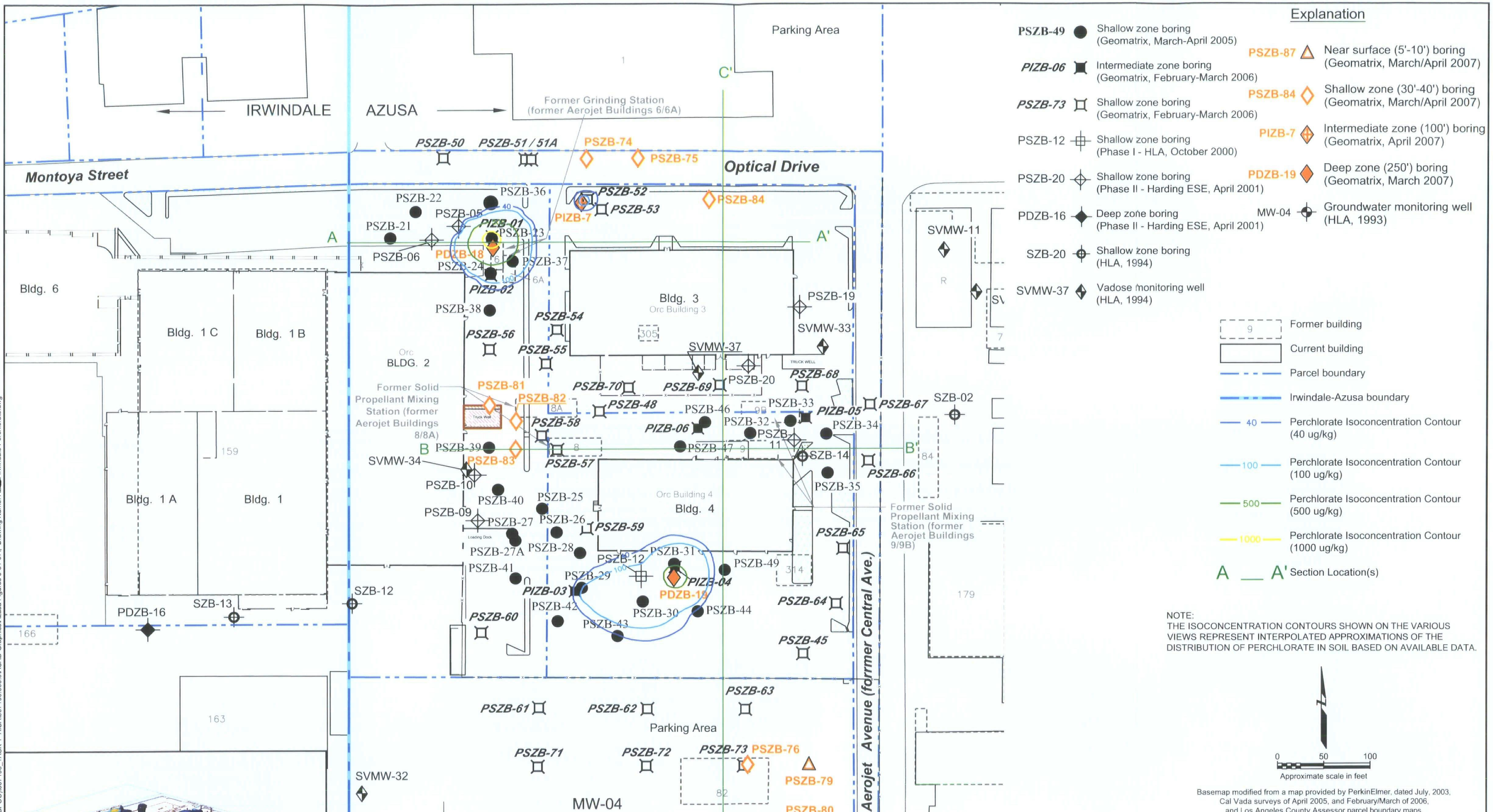

IRWINDALE
AZUSA
Montoya Street
Optical Drive
3rd Street
Aerojet Avenue (former Central Ave.)
Parking Area
Parking
Former Grinding Station (former Aerojet Buildings 6/6A)
Former Solid Propellant Mixing Station (former Aerojet Buildings 8/8A)
Former Solid Propellant Mixing Station (former Aerojet Buildings 9/9B)
Former Buildings 15/15a
Bldg. 6
Bldg. 1 C
Bldg. 1 B
Bldg. 1 A
Bldg. 1
Orc BLDG. 2
Bldg. 3
Orc Building 3
Bldg. 4
Orc Building 4
Truck Well
TRUCK WELL
Loading Dock
A
A'
B
B'
C
C'
PSZB-50
PSZB-51 / 51A
PSZB-74
PSZB-75
PSZB-36
PSZB-52
PSZB-53
PSZB-84
PIZB-7
PSZB-22
PSZB-05
PSZB-21
PIZB-01
PSZB-23
PSZB-06
PDZB-18
PSZB-24
PSZB-37
PIZB-02
PSZB-38
PSZB-54
PSZB-56
PSZB-55
PSZB-19
SVMW-33
SVMW-37
SVMW-11
PSZB-81
PSZB-82
PSZB-58
PSZB-70
PSZB-69
PSZB-20
PSZB-68
PSZB-48
PSZB-46
PSZB-33
PIZB-05
PSZB-67
SZB-02
PIZB-06
PSZB-32
PSZB-34
PSZB-39
PSZB-83
PSZB-57
PSZB-47
SZB-14
PSZB-66
SVMW-34
PSZB-10
PSZB-35
PSZB-40
PSZB-25
PSZB-09
PSZB-27
PSZB-26
PSZB-59
PSZB-65
PSZB-27A
PSZB-28
PSZB-31
PSZB-12
PSZB-49
PSZB-41
PSZB-29
PIZB-04
PIZB-03
PDZB-19
PSZB-64
PSZB-42
PSZB-30
PSZB-44
PSZB-43
PSZB-60
PSZB-45
SZB-12
PDZB-16
SZB-13
PSZB-63
PSZB-61
PSZB-62
PSZB-71
PSZB-72
PSZB-73
PSZB-76
PSZB-79
PSZB-80
SVMW-32
MW-04
PSZB-87
PSZB-13
PDZB-06
PSZB-77
PSZB-78
PSZB-86
PSZB-85
159
166
163
179
322
84
305
314
82
16
THREE-DIMENSIONAL PERCHLORATE DISTRIBUTION IN SOIL VIEWED FROM THE SOUTHWEST
Explanation
PSZB-49 Shallow zone boring (Geomatrix, March-April 2005)
PIZB-06 Intermediate zone boring (Geomatrix, February-March 2006)
PSZB-73 Shallow zone boring (Geomatrix, February-March 2006)
PSZB-12 Shallow zone boring (Phase I - HLA, October 2000)
PSZB-20 Shallow zone boring (Phase II - Harding ESE, April 2001)
PDZB-16 Deep zone boring (Phase II - Harding ESE, April 2001)
SZB-20 Shallow zone boring (HLA, 1994)
SVMW-37 Vadose monitoring well (HLA, 1994)
PSZB-87 Near surface (5'-10') boring (Geomatrix, March/April 2007)
PSZB-84 Shallow zone (30'-40') boring (Geomatrix, March/April 2007)
PIZB-7 Intermediate zone (100') boring (Geomatrix, April 2007)
PDZB-19 Deep zone (250') boring (Geomatrix, March 2007)
MW-04 Groundwater monitoring well (HLA, 1993)
Former building
Current building
Parcel boundary
Irwindale-Azusa boundary
40 Perchlorate Isoconcentration Contour (40 ug/kg)
100 Perchlorate Isoconcentration Contour (100 ug/kg)
500 Perchlorate Isoconcentration Contour (500 ug/kg)
1000 Perchlorate Isoconcentration Contour (1000 ug/kg)
A __ A' Section Location(s)
0 50 100
Approximate scale in feet

NOTE:
THE ISOCONCENTRATION CONTOURS SHOWN ON THE VARIOUS VIEWS REPRESENT INTERPOLATED APPROXIMATIONS OF THE DISTRIBUTION OF PERCHLORATE IN SOIL BASED ON AVAILABLE DATA.

Basemap modified from a map provided by PerkinElmer, dated July, 2003, Cal Vada surveys of April 2005, and February/March of 2006, and Los Angeles County Assessor parcel boundary maps.

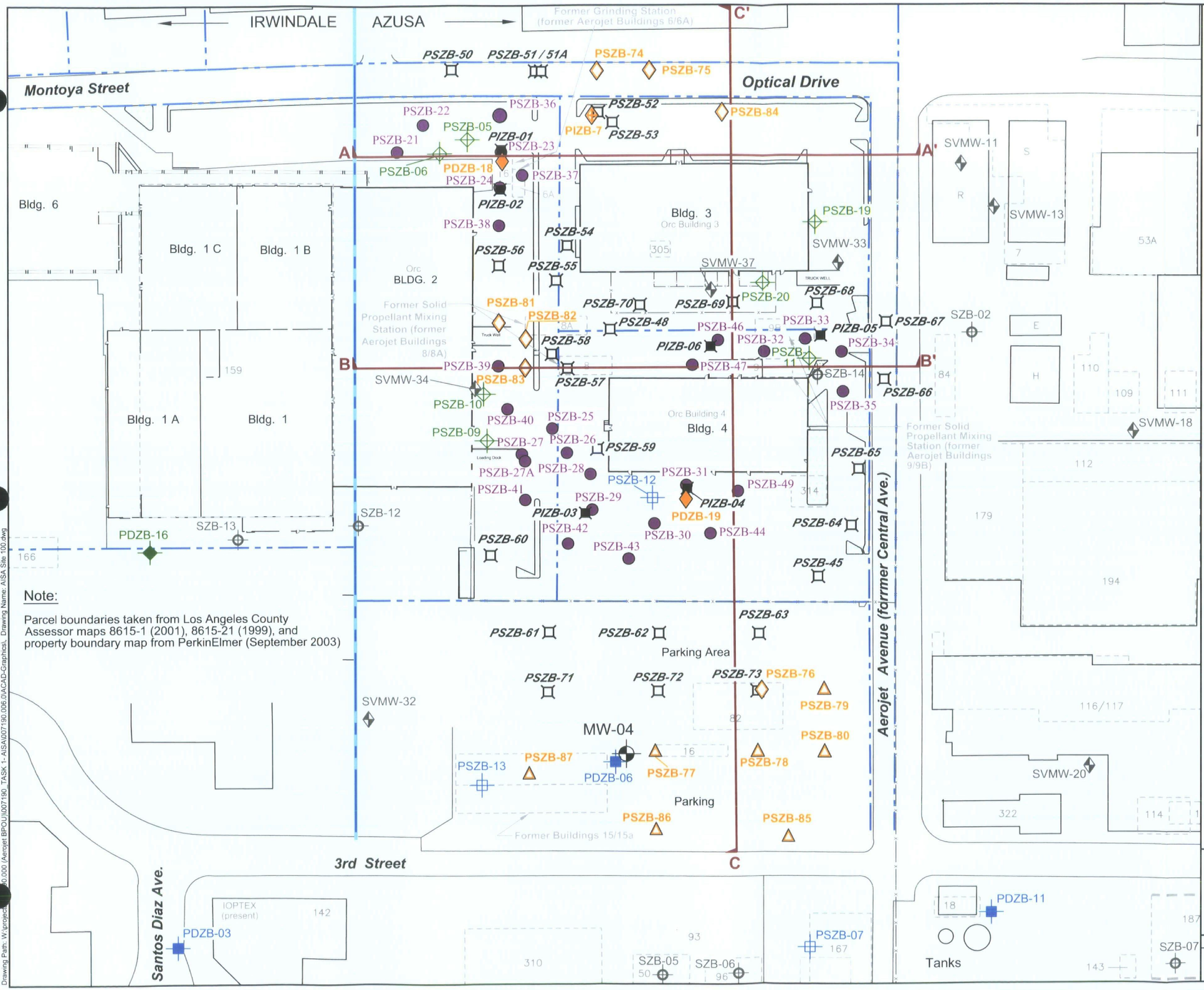
DISTRIBUTION OF PERCHLORATE BELOW 40 FEET BGS

ASUZA / IRWINDALE STUDY AREA
Azusa and Irwindale, California

By: jrw/ld | Date: 5/31/07 | Project No. 7190.006

Geomatrix | Figure 3-3

Plot Date: 05/31/07 - 2... Plotted by: jworker
Drawing Path: W:\project...190.000 (Aerojet BPOU)\007190_TASK 1- AISA\007190.006.0\ACAD-Graphics\Azusa Figures 5-31-07\, Drawing Name: A...rwindale Perchlorate.dwg



STUDY AREA SHOWING CROSS SECTION LINES

ASUZA / IRWINDALE STUDY AREA
Azusa and Irwindale, California

By: jrw	Date: 5/31/07	Project No. 7190.006
Geomatrix		Figure 3-4

Plot Date: 05/30/07 - 3:
Drawing Path: W:\project
Plotted by: jworker
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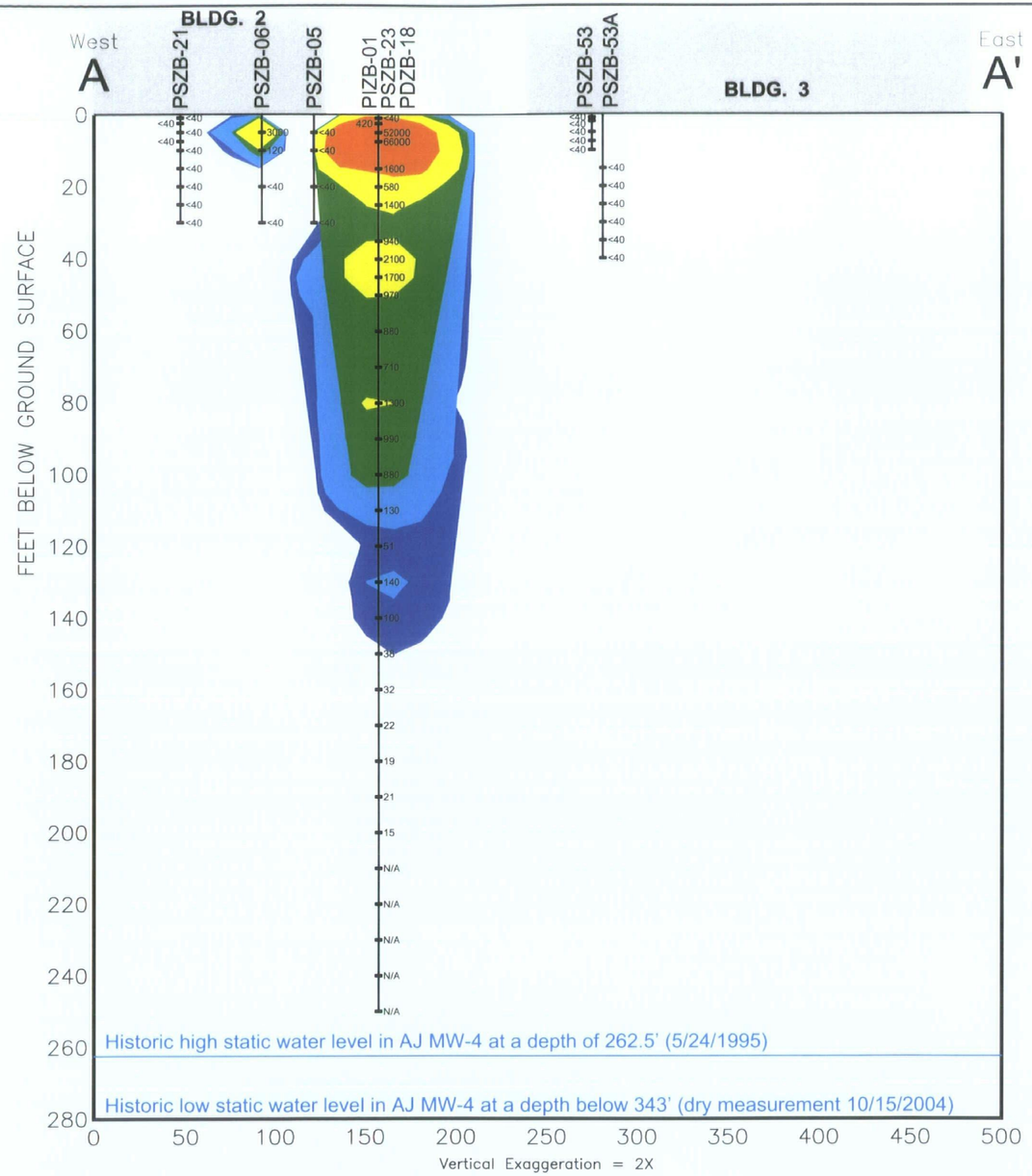
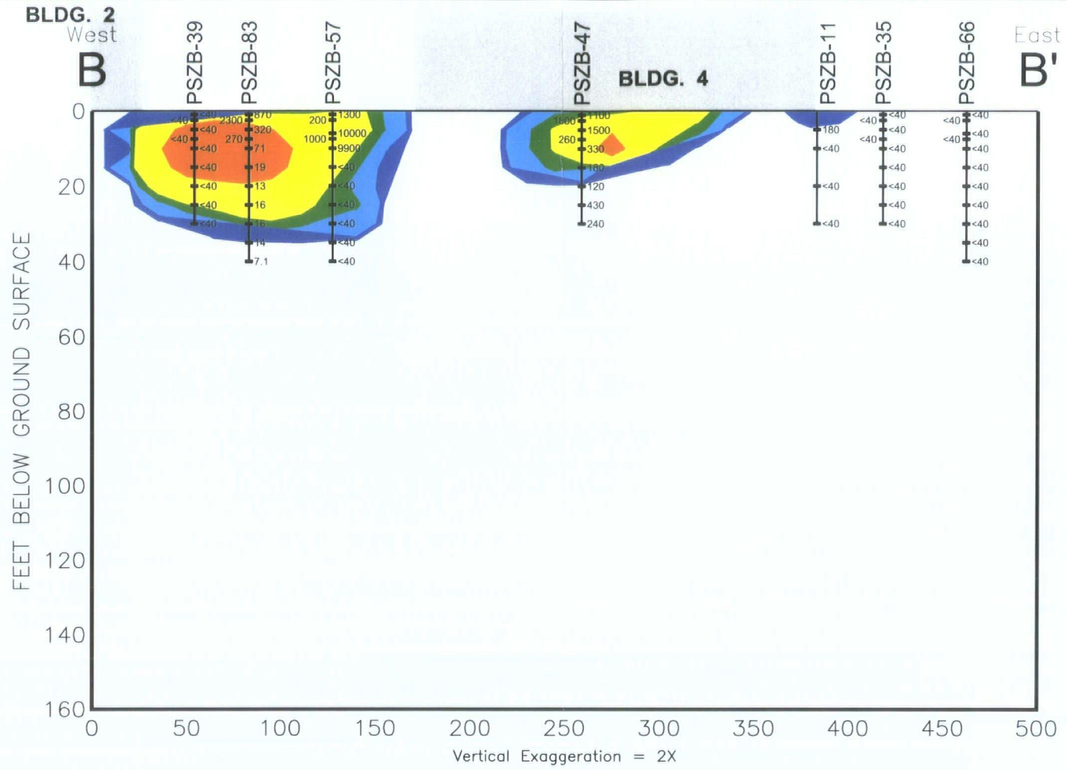




Explanation

Concentration of Perchlorate (ug/kg)

- >5000
- >1000
- >500
- >100
- >40
- <40

0 40 80
Approximate scale in feet

NOTE:
THE ISOCONCENTRATION CONTOURS SHOWN ON THE VARIOUS VIEWS REPRESENT INTERPOLATED APPROXIMATIONS OF THE DISTRIBUTION OF PERCHLORATE IN SOIL BASED ON AVAILABLE DATE.

THREE-DIMENSIONAL PERCHLORATE DISTRIBUTION IN SOIL VIEWED FROM THE SOUTHWEST

CROSS SECTION A-A' and CROSS SECTION B-B'

ASUZA / IRWINDALE STUDY AREA
Azusa and Irwindale, California

By: Id	Date: 5/31/07	Project No. 7190.006
Geomatrix		Figure 3-5

Plot Date: 05/31/07 - 11:52a
Drawing Path: W:\projects\007190000 (Aerojet BPOU)\007190_TASK 1- AIS\A007190.006.0\ACAD-Graphics\Azusa Figures 5-31-07\, Drawing Name: Azusa-Irwindale Perchlorate Section.dwg
Plotted by: jworker

South

C

PSZB-78

PSZB-73

PSZB-49

BLDG. 4

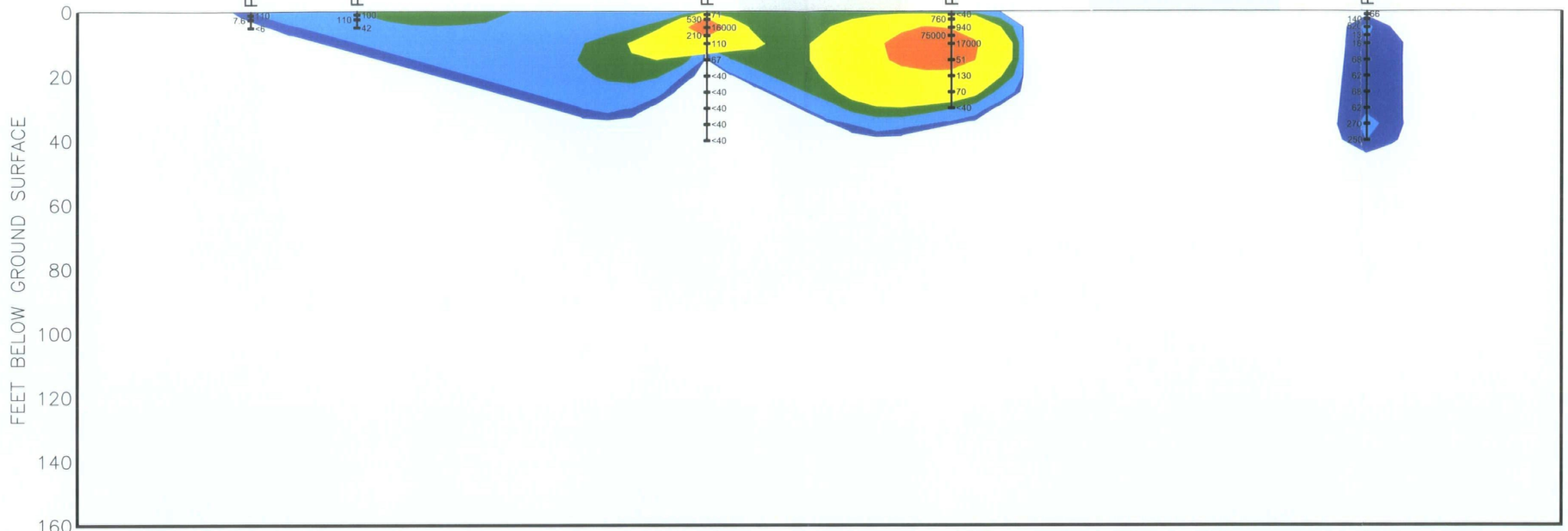
PSZB-32

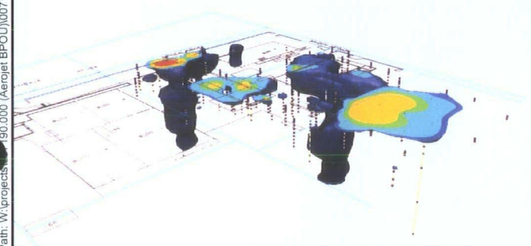
BLDG. 3

PSZB-84

North

C'





THREE-DIMENSIONAL PERCHLORATE DISTRIBUTION IN SOIL VIEWED FROM THE SOUTHWEST

Explanation

>5000	Concentration of Perchlorate (ug/kg)
>1000	
>500	
>100	
>40	
<40	

0 40 80

Approximate scale in feet

NOTE:
THE ISOCONCENTRATION CONTOURS SHOWN ON THE VARIOUS VIEWS REPRESENT INTERPOLATED APPROXIMATIONS OF THE DISTRIBUTION OF PERCHLORATE IN SOIL BASED ON AVAILABLE DATE.

CROSS SECTION C-C'

ASUZA / IRWINDALE STUDY AREA
Azusa and Irwindale, California

By: ld	Date: 5/31/07	Project No. 7190.006
Geomatrix		Figure 3-6

Plot Date: 05/31/07 - 1 Plotted by: jworker
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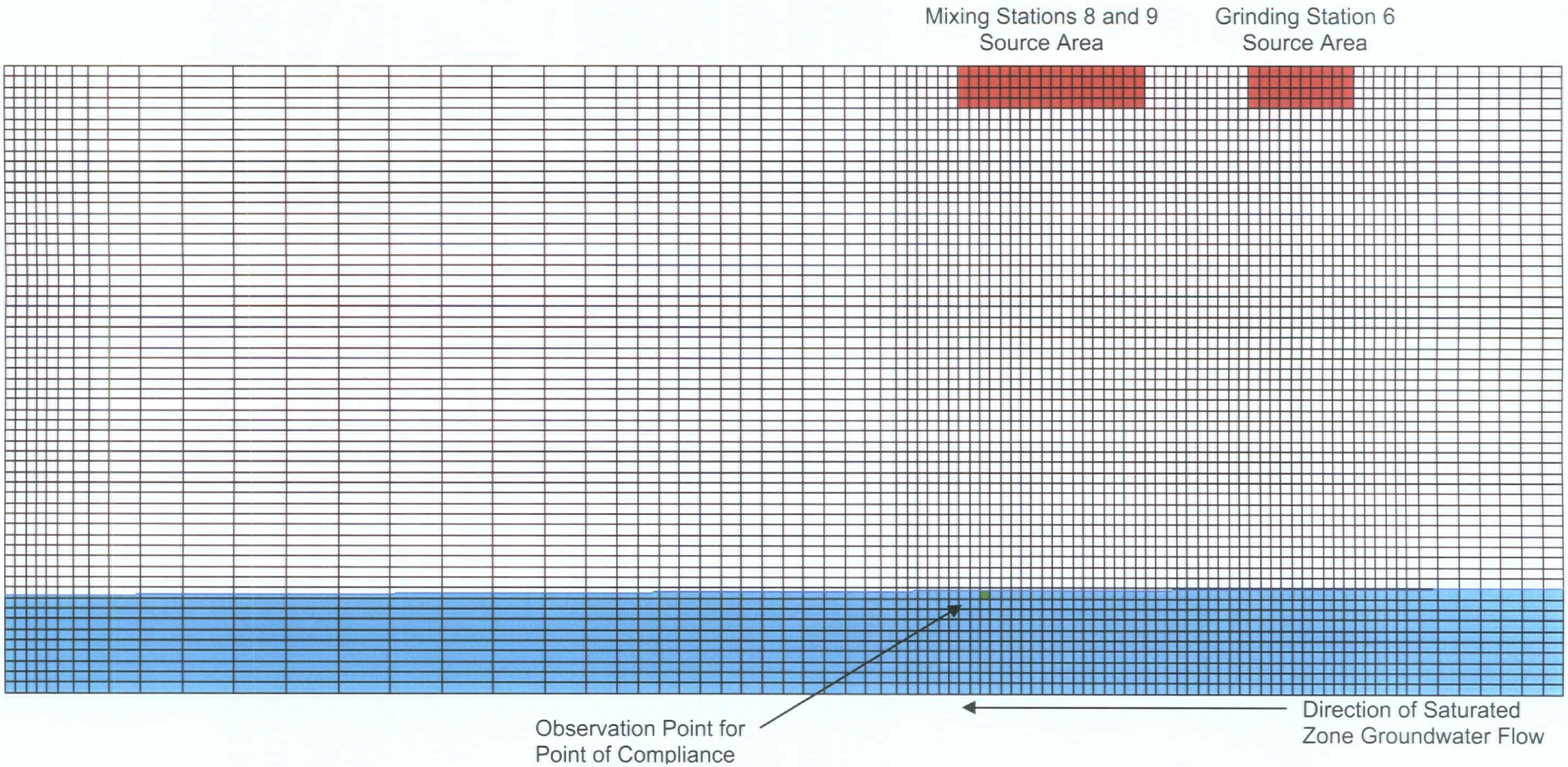
Non-GDS



Geomatrix

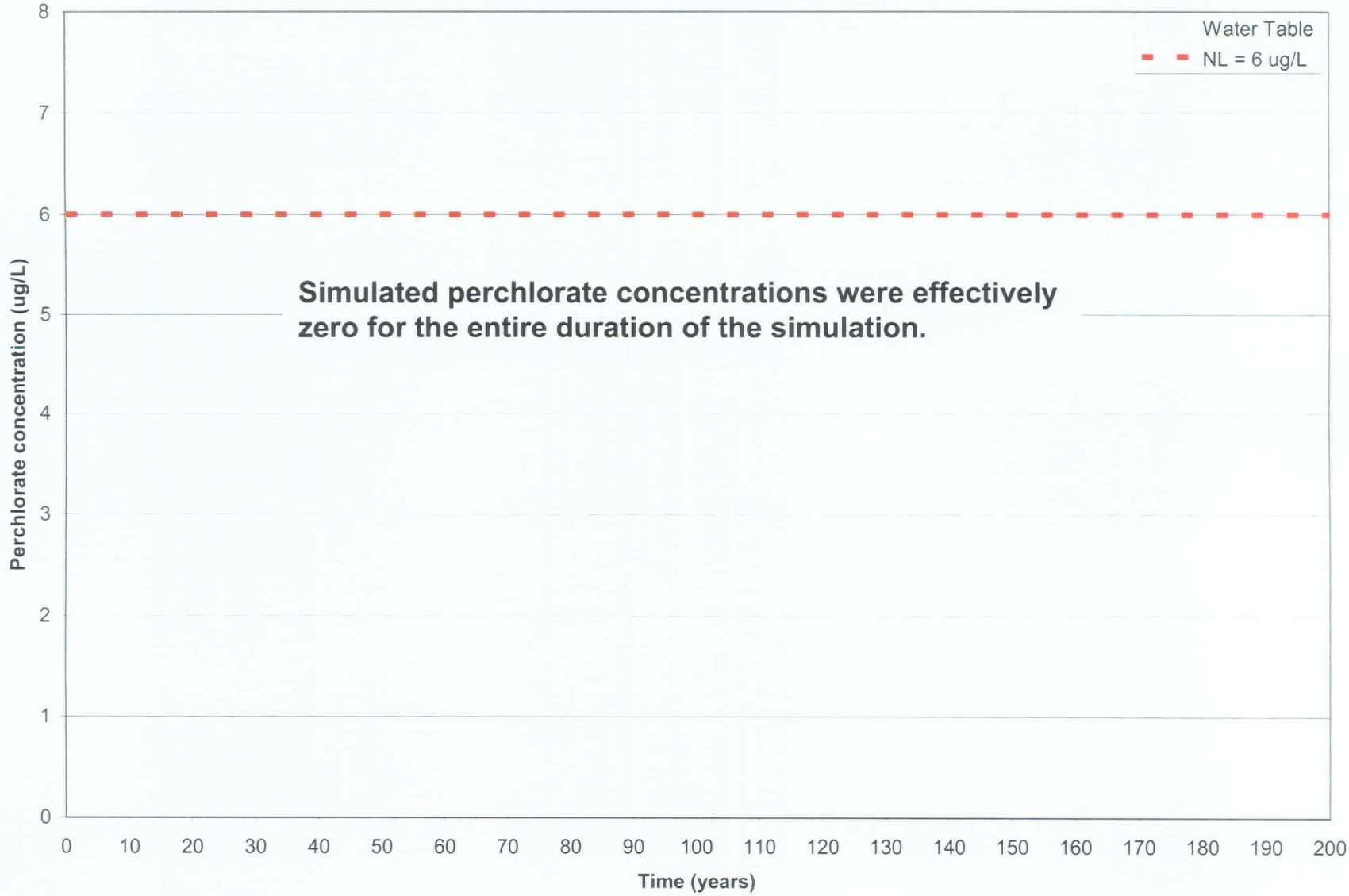
VS2DT MODEL DOMAIN AND SOURCE AREAS
Azusa/Irwindale Study Area
Azusa and Irwindale, California

Project No.
7190.006

Figure
4-1

L:\Project\7190\AISA\AOC Characterization Results\2007_kkz_temp\Figure 6-2_NoInfiltration.doc

Non-GDS



Geomatrix

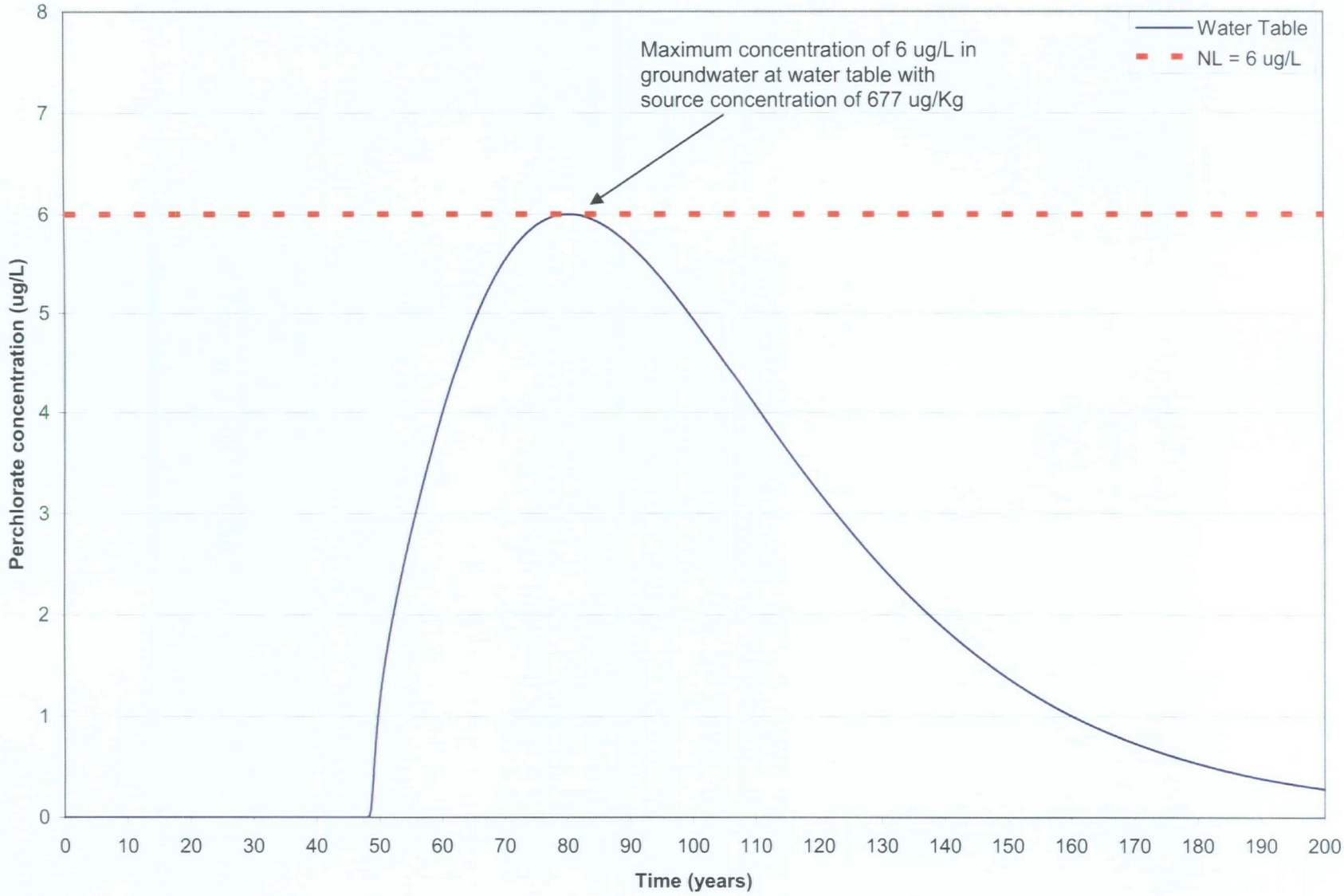
PREDICTED PERCHLORATE CONCENTRATION IN GROUNDWATER,
NO INFILTRATION SCENARIO
Azusa/Irwindale Study Area
Azusa and Irwindale, California

Project No.
7190.006

Figure
4-2

L:\Project\7190\AISA\AOC Characterization Results\\2007_kkz_temp\Figure 6-3_Precip Only.doc

Non-GDS



Geomatrix

PREDICTED PERCHLORATE CONCENTRATION IN GROUNDWATER,
INFILTRATION OF PRECIPITATION SCENARIO
Azusa/Irwindale Study Area
Azusa and Irwindale, California

Project No.
7190.006

Figure
4-3

PARTIALLY SCANNED
OVERSIZE ITEM(S)

See document # 2261490
for partially scanned image(s).

For complete hardcopy version of the oversize document
contact the Region IX Superfund Records Center

APPENDIX A

BORING LOGS

PROJECT: AZUSA/IRWINDALE STUDY AREA Azusa and Irwindale, California	**Log of Boring No. PSZB-74**
BORING LOCATION: Optical Drive	ELEVATION AND DATUM: 571.35 ft msl (NAVD 88)
DRILLING CONTRACTOR: Layne Christensen Company	DATE STARTED: 3/29/07 / DATE FINISHED: 4/11/07
DRILLING METHOD: Dual Wall Air Percussion	TOTAL DEPTH (ft.): 40.00 / MEASURING POINT: Ground surface
DRILLING EQUIPMENT: Foremost Drills AP-1000	DEPTH TO WATER: FIRST NA / COMPL. NA / 24 HRS. NA
SAMPLING METHOD: Cuttings from cyclone	LOGGED BY: K. Zeiler/L. Budny
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: G. Rees / REG. NO. 6612

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. Surface Elevation: 571.35 ft msl (NAVD 88)	PID READING (ppm)	REMARKS
				~4" asphalt		Air knifed to 5 feet below ground surface (bgs) by WDC on 3/29/07
1	PSZB-74-1			POORLY GRADED GRAVEL with SAND (GP): dark brown (10YR 3/3), moist, ~60% gravel, ~40% fine to coarse sand, trace fines		1' and 2.5' samples collected from sidewalls of boring; 5' sample collected using a hand auger then boring backfilled with cuttings
2						
3	PSZB-74-2.5					
4						
5	PSZB-74-5					Drilled to 40' bgs with 9" casing and hammer bit on 4/11/07
6				POORLY GRADED SAND (SP): dark yellowish brown (10YR 3/6), moist, ~90% fine to coarse sand, ~10% gravel		Lithology assessed from cuttings collected through the cyclone
7						
8	PSZB-74-7.5					
9				POORLY GRADED SAND with GRAVEL (SP): dark yellowish brown (10YR 3/6), moist, ~80% fine to coarse sand, ~20% gravel		
10	PSZB-74-10					
11						
12						
13						
14						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PSZB-74 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
15	PSZB-74-15			POORLY GRADED SAND with GRAVEL (SP): continued		
16						
17				light brownish gray (10YR 6/2)		
18						
19						
20	PSZB-74-20					
21						
22				~85% fine to coarse sand, ~15% gravel		
23						
24						
25	PSZB-74-25					
26						
27						
28				POORLY GRADED SAND (SP): dark yellowish brown (10YR 4/4), moist, ~90% fine to coarse sand, ~10% gravel		
29						
30	PSZB-74-30					
31						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PSZB-74 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
32				POORLY GRADED SAND (SP): continued		
33						
34						
35	PSZB-74-35	■				
36						
37						
38						
39						
40	PSZB-74-40	■		Bottom of boring at 40 ft bgs		Boring backfilled with bentonite chips and continuously hydrated Surface patched with asphalt
41						
42						
43						
44						
45						
46						
47						
48						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA Azusa and Irwindale, California	**Log of Boring No. PSZB-75**
BORING LOCATION: Optical Drive	ELEVATION AND DATUM: 571.76 ft msl (NAVD 88)
DRILLING CONTRACTOR: Layne Christensen Company	DATE STARTED: 3/29/07 / DATE FINISHED: 4/11/07
DRILLING METHOD: Dual Wall Air Percussion	TOTAL DEPTH (ft.): 40.00 / MEASURING POINT: Ground surface
DRILLING EQUIPMENT: Foremost Drills AP-1000	DEPTH TO WATER: FIRST NA / COMPL. NA / 24 HRS. NA
SAMPLING METHOD: Cuttings from cyclone	LOGGED BY: K. Zeiler/L. Budny
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: G. Rees / REG. NO. 6612

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				Surface Elevation: 571.76 ft msl (NAVD 88)		
				~4" asphalt		Air knifed to 5 feet below ground surface (bgs) by WDC on 3/29/07
1	PSZB-75-1			POORLY GRADED GRAVEL with SAND (GP): brown (7.5YR 5/2), moist, ~60% fine to coarse gravel, ~40% fine to coarse sand, trace fines		1' and 2.5' samples collected from sidewalls of boring; 5' sample collected using a hand auger then boring backfilled with cuttings
2						
3	PSZB-75-2.5					
4						
5	PSZB-75-5			~80% gravel, ~20% fine to coarse sand, trace fines		Drilled to 40' bgs with 9" casing and hammer bit on 4/11/07
6						Lithology assessed from cuttings collected through the cyclone
7						
8	PSZB-75-7.5					
9				POORLY GRADED SAND (SP): dark brown (10YR 3/3), moist, ~90% fine to coarse sand, ~10% gravel		
10	PSZB-75-10					
11						
12						
13				light brownish gray (10YR 6/2)		
14						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PSZB-75 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				POORLY GRADED SAND (SP): continued		
15	PSZB-75-15					
16						
17						
				dark yellowish brown (10YR 4/6), ~95% fine to coarse sand, ~5% gravel		
18						
19						
20	PSZB-75-20					
21						
22						
				yellowish brown (10YR 5/4), ~90% fine to coarse sand, ~10% gravel		
23						
24						
25	PSZB-75-25					
26						
27						
				dark yellowish brown (10YR 3/6)		
28						
29						
30	PSZB-75-30					
31						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PSZB-75 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
32				POORLY GRADED SAND (SP): continued		
33						
34						
35	PSZB-75-35	■				
36						
37						
38						
39						
40	PSZB-75-40	■		Bottom of boring at 40 ft bgs		Boring backfilled with bentonite chips and continuously hydrated Surface patched with asphalt
41						
42						
43						
44						
45						
46						
47						
48						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA Azusa and Irwindale, California	**Log of Boring No. PSZB-76**
BORING LOCATION: Northrop Grumman	ELEVATION AND DATUM: 563.39 ft msl (NAVD 88)
DRILLING CONTRACTOR: Layne Christensen Company	DATE STARTED: 4/12/07 / DATE FINISHED: 4/12/07
DRILLING METHOD: Dual Wall Air Percussion	TOTAL DEPTH (ft.): 40.00 / MEASURING POINT: Ground surface
DRILLING EQUIPMENT: Foremost Drills AP-1000	DEPTH TO WATER: FIRST NA / COMPL. NA / 24 HRS. NA
SAMPLING METHOD: Cuttings from cyclone	LOGGED BY: L. Budny
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: G. Rees / REG. NO. 6612

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				Surface Elevation: 563.39 ft msl (NAVD 88)		
				~6" asphaltic concrete		Boring advanced through air knife location PSZB-73 Begin sampling at 7.5 feet below ground surface (bgs)
1				POORLY GRADED GRAVEL with SAND (GP): brown (7.5YR 5/4), moist, ~85% gravel, ~15% fine to coarse sand		
2						Drilled to 40' bgs with 9" casing and hammer bit
3						Lithology assessed from cuttings collected through the cyclone
4						
5				POORLY GRADED SAND with GRAVEL (SP): pale brown (10YR 6/3), moist, ~75% fine to coarse sand, ~25% gravel		
6						
7						
8	PSZB-76-7.5					
9						
10	PSZB-76-10					
11						
12						
13				light yellowish brown (10YR 6/4), ~85% fine to coarse sand, ~15% gravel		
14						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PSZB-76 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				POORLY GRADED SAND with GRAVEL (SP): continued		
15	PSZB-76-15					
16						
17						
18						
19						
20	PSZB-76-20					
21						
22						
23				brown (10YR 5/3)		
24						
25	PSZB-76-25					
26						
27						
28				~70% fine to medium sand, ~30% gravel		
29						
30	PSZB-76-30					
31						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PSZB-76 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
32				POORLY GRADED SAND with GRAVEL (SP): continued		
33						
34						
35	PSZB-76-35					
36						
37						
38				POORLY GRADED GRAVEL with SAND (GP): pale brown (10YR 6/3), moist, ~80% gravel, ~20% fine to coarse sand		
39						
40	PSZB-76-40			Bottom of boring at 40 ft bgs		Boring backfilled with bentonite chips and continuously hydrated Surface patched with concrete
41						
42						
43						
44						
45						
46						
47						
48						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA Azusa and Irwindale, California	**Log of Boring No. PSZB-77**
BORING LOCATION: Northrop Grumman	ELEVATION AND DATUM: 560.78 ft msl (NAVD 88)
DRILLING CONTRACTOR: Layne Christensen Company	DATE STARTED: 3/29/07 / DATE FINISHED: 4/12/07
DRILLING METHOD: Dual Wall Air Percussion	TOTAL DEPTH (ft.): 10.00 / MEASURING POINT: Ground surface
DRILLING EQUIPMENT: Foremost Drills AP-1000	DEPTH TO WATER: FIRST NA / COMPL. NA / 24 HRS. NA
SAMPLING METHOD: Cuttings from cyclone	LOGGED BY: K. Zeiler/L. Budny
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: G. Rees / REG. NO. 6612

DEPTH (feet)	SAMPLES: Sample No.	Sample	Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				Surface Elevation: 560.78 ft msl (NAVD 88)		
				~4" asphalt		Air knifed to 5 feet below ground surface (bgs) by WDC on 3/29/07
1	PSZB-77-1			POORLY GRADED GRAVEL with SAND (GP): brown (7.5YR 5/2), moist, ~70% gravel, ~30% fine to coarse sand, trace fines		1' and 2.5' samples collected from sidewalls of boring; 5' sample collected using a hand auger then boring backfilled with cuttings
2						
3	PSZB-77-2.5					
4						
5	PSZB-77-5					Drilled to 40' bgs with 9" casing and hammer bit on 4/12/07
6						Lithology assessed from cuttings collected through the cyclone
7						
8	PSZB-77-7.5					
9				very pale brown (10YR 7/3), ~75% gravel, ~25% fine to coarse sand		
10	PSZB-77-10			Bottom of boring at 10 ft bgs		Boring backfilled with bentonite chips and continuously hydrated
11						Surface patched with asphalt
12						
13						
14						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA Azusa and Irwindale, California	**Log of Boring No. PSZB-78**
BORING LOCATION: Northrop Grumman	ELEVATION AND DATUM: 562.04 ft msl (NAVD 88)
DRILLING CONTRACTOR: WDC Exploration & Wells	DATE STARTED: 3/29/07 / DATE FINISHED: 3/29/07
DRILLING METHOD: Air Knife	TOTAL DEPTH (ft.): 5.00 / MEASURING POINT: Ground surface
DRILLING EQUIPMENT: John Deere Power Tech compressor	DEPTH TO WATER / FIRST: NA / COMPL.: NA / 24 HRS.: NA
SAMPLING METHOD: Hand auger and grab samples	LOGGED BY: K. Zeiler
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: G. Rees / REG. NO. 6612

DEPTH (feet)	SAMPLES: Sample No.	Sample	Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				Surface Elevation: 562.04 ft msl (NAVD 88)		
				~4" asphalt		
1	PSZB-78-1			POORLY GRADED GRAVEL with SAND (GP): brown (10YR 4/3), moist, ~65% gravel, ~35% fine to coarse sand, trace fines		Lithology assessed from visual observation of boring sidewalls and cuttings 1' and 2.5' samples collected from sidewalls of boring; 5' sample collected using a hand auger
2						
3	PSZB-78-2.5					
4						
				~85% gravel, ~15% fine to coarse sand, trace fines		
5	PSZB-78-5			Bottom of boring at 5 ft bgs		Boring backfilled with bentonite chips and continuously hydrated Surface patched with asphalt
6						
7						
8						
9						
10						
11						
12						
13						
14						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA Azusa and Irwindale, California	**Log of Boring No. PSZB-79**
BORING LOCATION: Northrop Grumman	ELEVATION AND DATUM: 564.34 ft msl (NAVD 88)
DRILLING CONTRACTOR: WDC Exploration & Wells	DATE STARTED: 3/28/07 / DATE FINISHED: 3/28/07
DRILLING METHOD: Air Knife	TOTAL DEPTH (ft.): 5.50 / MEASURING POINT: Ground surface
DRILLING EQUIPMENT: John Deere Power Tech compressor	DEPTH TO WATER / FIRST: NA / COMPL.: NA / 24 HRS.: NA
SAMPLING METHOD: Hand auger and grab samples	LOGGED BY: K. Zeiler
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: G. Rees / REG. NO.: 6612

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				Surface Elevation: 564.34 ft msl (NAVD 88)		
				~3" asphalt		Lithology assessed from visual observation of boring sidewalls and cuttings
1	PSZB-79-1			POORLY GRADED GRAVEL with SAND (GP): reddish brown (5YR 4/3), moist, ~70% gravel, ~30% fine to coarse sand, trace fines		1' and 2.5' samples collected from sidewalls of boring; 5' sample collected using a hand auger
2						
3	PSZB-79-2.5					
4						
5	PSZB-79-5					Wood fragments (construction fill) at 5' bgs
				Bottom of boring at 5.5 ft bgs		Concrete slab across bottom of hole
6						Boring backfilled with bentonite chips and continuously hydrated
7						
8						Surface patched with asphalt
9						
10						
11						
12						
13						
14						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA Azusa and Irwindale, California	**Log of Boring No. PSZB-80**
BORING LOCATION: Northrop Grumman	ELEVATION AND DATUM: 563.15 ft msl (NAVD 88)
DRILLING CONTRACTOR: WDC Exploration & Wells	DATE STARTED: 3/28/07 / DATE FINISHED: 3/28/07
DRILLING METHOD: Air Knife	TOTAL DEPTH (ft.): 6.25 / MEASURING POINT: Ground surface
DRILLING EQUIPMENT: John Deere Power Tech compressor	DEPTH TO WATER: FIRST NA / COMPL. NA / 24 HRS. NA
SAMPLING METHOD: Hand auger and grab samples	LOGGED BY: K. Zeiler
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: G. Rees / REG. NO. 6612

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				Surface Elevation: 563.15 ft msl (NAVD 88)		
				~3" asphalt		
1	PSZB-80-1			POORLY GRADED GRAVEL with SAND (GP): grayish brown (10YR 5/2), moist, ~80% gravel, ~20% fine to coarse sand, trace fines		Lithology assessed from visual observation of boring sidewalls and cuttings 1' and 2.5' samples collected from sidewalls of boring; 5' sample collected using a hand auger
2						
3	PSZB-80-2.5					
4						
5	PSZB-80-5					
6				Bottom of boring at 6.25 ft bgs		Hole caved in at 6' bgs Boring backfilled with bentonite chips and continuously hydrated Surface patched with asphalt
7						
8						
9						
10						
11						
12						
13						
14						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA Azusa and Irwindale, California	**Log of Boring No. PSZB-81**
BORING LOCATION: Former PerkinElmer	ELEVATION AND DATUM: 564.91 ft msl (NAVD 88)
DRILLING CONTRACTOR: Layne Christensen Company	DATE STARTED: 4/2/07 / DATE FINISHED: 4/9/07
DRILLING METHOD: Dual Wall Air Percussion	TOTAL DEPTH (ft.): 40.00 / MEASURING POINT: Ground surface
DRILLING EQUIPMENT: Foremost Drills AP-1000	DEPTH TO WATER: FIRST NA / COMPL. NA / 24 HRS. NA
SAMPLING METHOD: Cuttings from cyclone	LOGGED BY: P. Jeffers/L. Budny
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: G. Rees / REG. NO. 6612

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter. *Surface Elevation: 564.91 ft msl (NAVD 88)*	PID READING (ppm)	REMARKS
				~6" asphalt		Air knifed to 5 feet below ground surface (bgs) by WDC on 4/2/07
1	PSZB-81-1			POORLY GRADED SAND with GRAVEL (SP): yellowish brown (10YR 5/4), moist, ~85% fine to coarse sand, ~15% gravel		1' and 2.5' samples collected from sidewalls of boring; 5' sample collected using a hand auger then boring backfilled with cuttings
2						
3	PSZB-81-2.5					
4						
5	PSZB-81-5					Drilled to 40' bgs with 9" casing and hammer bit on 4/9/07
6						Lithology assessed from cuttings collected through the cyclone
7						
8	PSZB-81-7.5					
9				POORLY GRADED GRAVEL with SAND (GP): yellowish brown (10YR 5/4), moist, ~85% gravel, ~15% fine to coarse sand		
10	PSZB-81-10					
11						
12						
13				POORLY GRADED SAND with GRAVEL (SP): light brownish gray (10YR 6/2), moist, ~85% fine to medium sand, ~15% gravel		
14						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PSZB-81 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				POORLY GRADED SAND with GRAVEL (SP): continued		
15	PSZB-81-15					
16						
17						
18						
19						
20	PSZB-81-20					
21						
22						
23						
24						
25	PSZB-81-25					
26						
27						
28				dark yellowish brown (10YR 4/4)		
29						
30	PSZB-81-30					
31						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PSZB-81 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
32				POORLY GRADED SAND with GRAVEL (SP): continued		
33				light brownish gray (10YR 6/2)		
34						
35	PSZB-81-35					
36						
37						
38				POORLY GRADED SAND (SP): dark yellowish brown (10YR 4/6), *moist, ~90% medium to coarse sand, ~10% gravel*		
39						
40	PSZB-81-40			Bottom of boring at 40 ft bgs		*Boring backfilled with bentonite chips and continuously hydrated* Surface patched with asphalt
41						
42						
43						
44						
45						
46						
47						
48						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA Azusa and Irwindale, California	**Log of Boring No. PSZB-82**
BORING LOCATION: Former PerkinElmer	ELEVATION AND DATUM: 564.83 ft msl (NAVD 88)
DRILLING CONTRACTOR: Layne Christensen Company	DATE STARTED: 4/2/07 / DATE FINISHED: 4/9/07
DRILLING METHOD: Dual Wall Air Percussion	TOTAL DEPTH (ft.): 40.00 / MEASURING POINT: Ground surface
DRILLING EQUIPMENT: Foremost Drills AP-1000	DEPTH TO WATER: FIRST NA / COMPL. NA / 24 HRS. NA
SAMPLING METHOD: Cuttings from cyclone	LOGGED BY: P. Jeffers/L. Budny
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: G. Rees / REG. NO. 6612

DEPTH (feet)	SAMPLES: Sample No.	Sample	Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				Surface Elevation: 564.83 ft msl (NAVD 88)		
				~6" asphalt		Air knifed to 5 feet below ground surface (bgs) by WDC on 4/2/07
1	PSZB-82-1			POORLY GRADED SAND with GRAVEL (SP): yellowish brown (10YR 5/4), moist, ~80% fine to coarse sand, ~20% gravel		1' and 2.5' samples collected from sidewalls of boring; 5' sample collected using a hand auger then boring backfilled with cuttings
2						
3	PSZB-82-2.5					
4						
5	PSZB-82-5					Drilled to 40' bgs with 9" casing and hammer bit on 4/9/07
6						Lithology assessed from cuttings collected through the cyclone
7						
8	PSZB-82-7.5					
9						
10	PSZB-82-10					
11						
12						
13				POORLY GRADED GRAVEL with SAND (GP): yellowish brown (10YR 5/4), moist, ~85% gravel, ~15% fine to coarse sand		
14						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PSZB-82 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
15	PSZB-82-15			POORLY GRADED GRAVEL with SAND (GP): continued		
16						
17						
18						
19						
20	PSZB-82-20					
21						
22						
23						
24				POORLY GRADED SAND with GRAVEL (SP): light brownish gray (10YR 6/2), moist, ~85% fine to coarse sand, ~15% gravel		
25	PSZB-82-25					
26						
27						
28				POORLY GRADED SAND (SP): dark yellowish brown (10YR 4/4), moist, ~90% fine to coarse sand, ~10% gravel		
29						
30	PSZB-82-30					
31						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PSZB-82 (cont'd)

DEPTH (feet)	SAMPLES Sample No.	SAMPLES Sample	SAMPLES Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
32				POORLY GRADED SAND (SP): continued		
33						
34				light brownish gray (10YR 6/2)		
35	PSZB-82-35					
36						
37				dark yellowish brown (10YR 4/4)		
38						
39						
40	PSZB-82-40			Bottom of boring at 40 ft bgs		Boring backfilled with bentonite chips and continuously hydrated Surface patched with asphalt
41						
42						
43						
44						
45						
46						
47						
48						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA Azusa and Irwindale, California	**Log of Boring No. PSZB-83**
BORING LOCATION: Former PerkinElmer	ELEVATION AND DATUM: 564.47 ft msl (NAVD 88)
DRILLING CONTRACTOR: Layne Christensen Company	DATE STARTED: 4/2/07 / DATE FINISHED: 4/10/07
DRILLING METHOD: Dual Wall Air Percussion	TOTAL DEPTH (ft.): 40.00 / MEASURING POINT: Ground surface
DRILLING EQUIPMENT: Foremost Drills AP-1000	DEPTH TO WATER: FIRST NA / COMPL. NA / 24 HRS. NA
SAMPLING METHOD: Cuttings from cyclone	LOGGED BY: P. Jeffers/L. Budny
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: G. Rees / REG. NO. 6612

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				Surface Elevation: 564.47 ft msl (NAVD 88)		
				~6" asphalt		Air knifed to 5 feet below ground surface (bgs) by WDC on 4/2/07 1' and 2.5' samples collected from sidewalls of boring; 5' sample collected using a hand auger then boring backfilled with cuttings
1	PSZB-83-1			POORLY GRADED SAND (SP): yellowish brown (10YR 5/4), moist, 100% medium to coarse sand		
2				trace gravel		
3	PSZB-83-2.5					
4				POORLY GRADED SAND with GRAVEL (SP): yellowish brown (10YR 5/4), moist, ~85% medium to coarse sand, ~15% gravel		
5	PSZB-83-5					Drilled to 40' bgs with 9" casing and hammer bit on 4/10/07 Lithology assessed from cuttings collected through the cyclone
6						
7						
8	PSZB-83-7.5					
9				POORLY GRADED GRAVEL with SAND (GP): light brownish gray (10YR 6/2), moist, ~85% gravel, ~15% fine to coarse sand		
10	PSZB-83-10					
11						
12						
13				POORLY GRADED SAND with GRAVEL (SP): pale brown (10YR 6/3), moist, ~85% fine to coarse sand, ~15% gravel		
14						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PSZB-83 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
15	PSZB-83-15			POORLY GRADED SAND with GRAVEL (SP): continued		
16						
17						
18						
19						
20	PSZB-83-20					
21						
22						
23						
24						
25	PSZB-83-25					
26						
27						
28				POORLY GRADED SAND (SP): dark yellowish brown (10YR 4/6), moist, ~90% fine to coarse sand, ~10% gravel		
29						
30	PSZB-83-30					
31						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PSZB-83 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
32				POORLY GRADED SAND (SP): continued		
33						
34						
35	PSZB-83-35					
36						
37						
				pale brown (10YR 6/3)		
38						
39						
40	PSZB-83-40			Bottom of boring at 40 ft bgs		Boring backfilled with bentonite chips and continuously hydrated Surface patched with asphalt
41						
42						
43						
44						
45						
46						
47						
48						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA Azusa and Irwindale, California	**Log of Boring No. PSZB-84**
BORING LOCATION: Former PerkinElmer	ELEVATION AND DATUM: 570.81 ft msl (NAVD 88)
DRILLING CONTRACTOR: Layne Christensen Company	DATE STARTED: 4/10/07 / DATE FINISHED: 4/10/07
DRILLING METHOD: Dual Wall Air Percussion	TOTAL DEPTH (ft.): 40.00 / MEASURING POINT: Ground surface
DRILLING EQUIPMENT: Foremost Drills AP-1000	DEPTH TO WATER: FIRST NA / COMPL. NA / 24 HRS. NA
SAMPLING METHOD: Cuttings from cyclone	LOGGED BY: L. Budny
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: G. Rees / REG. NO. 6612

DEPTH (feet)	SAMPLES: Sample No.	Sample	Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				Surface Elevation: 570.81 ft msl (NAVD 88)		
				~6" asphaltic concrete		Hand auger to 1 foot below below ground surface (bgs) Break obstruction
1	PSZB-84-1			POORLY GRADED SAND (SP): yellowish brown (10YR 5/4), moist, ~95% fine to coarse sand, ~5% gravel		1' and 2.5' samples collected from sidewalls of boring
2						
3	PSZB-84-2.5					Drilled to 40' bgs with 9" casing and hammer bit
4				POORLY GRADED SAND with GRAVEL (SP): pale brown (10YR 6/3), moist, ~85% fine to coarse sand, ~15% gravel		Lithology assessed from cuttings collected through the cyclone
5	PSZB-84-5					
6						
7						
8	PSZB-84-7.5					
9						
10	PSZB-84-10					
11						
12						
13						
14						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PSZB-84 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
15	PSZB-84-15			POORLY GRADED SAND with GRAVEL (SP): continued		
16						
17						
18				POORLY GRADED SAND (SP): yellowish brown (10YR 5/6), moist, ~90% fine to coarse sand, ~10% gravel		
19						
20	PSZB-84-20					
21						
22						
23						
24						
25	PSZB-84-25					
26						
27						
28				brown (10YR 5/3)		
29						
30	PSZB-84-30					
31						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PSZB-84 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
32				POORLY GRADED SAND (SP): continued		
33						
34						
35	PSZB-84-35					
36						
37				dark yellowish brown (10YR 4/6)		
38						
39						
40	PSZB-84-40			Bottom of boring at 40 ft bgs		Boring backfilled with bentonite chips and continuously hydrated Surface patched with asphalt
41						
42						
43						
44						
45						
46						
47						
48						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA Azusa and Irwindale, California	**Log of Boring No. PSZB-85**
BORING LOCATION: Northrop Grumman	ELEVATION AND DATUM: 560.87 ft msl (NAVD 88)
DRILLING CONTRACTOR: WDC Exploration & Wells	DATE STARTED: 4/20/07 / DATE FINISHED: 4/20/07
DRILLING METHOD: Air Knife	TOTAL DEPTH (ft.): 5.00 / MEASURING POINT: Ground surface
DRILLING EQUIPMENT: John Deere Power Tech compressor	DEPTH TO WATER: FIRST NA / COMPL. NA / 24 HRS. NA
SAMPLING METHOD: Hand auger and grab samples	LOGGED BY: P. Jeffers
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: G. Rees / REG. NO. 6612

DEPTH (feet)	SAMPLES: Sample No.	Sample	Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				Surface Elevation: 560.87 ft msl (NAVD 88)		
				~4" asphalt		Lithology assessed from visual observation of boring sidewalls and cuttings 1' and 2.5' samples collected from sidewalls of boring; 5' sample collected using a hand auger
1	PSZB-85-1			POORLY GRADED GRAVEL with SAND (GP): dark brown (7.5YR 3/4), moist, ~70% gravel, ~30% medium to coarse sand		
2						
3	PSZB-85-2.5					
4						
5	PSZB-85-5			Bottom of boring at 5 ft bgs		Boring backfilled with bentonite chips and continuously hydrated Surface patched with asphalt
6						
7						
8						
9						
10						
11						
12						
13						
14						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA Azusa and Irwindale, California	**Log of Boring No. PSZB-86**
BORING LOCATION: Northrop Grumman	ELEVATION AND DATUM: 558.64 ft msl (NAVD 88)
DRILLING CONTRACTOR: WDC Exploration & Wells	DATE STARTED: 4/20/07 / DATE FINISHED: 4/20/07
DRILLING METHOD: Air Knife	TOTAL DEPTH (ft.): 5.00 / MEASURING POINT: Ground surface
DRILLING EQUIPMENT: John Deere Power Tech compressor	DEPTH TO WATER / FIRST: NA / COMPL.: NA / 24 HRS.: NA
SAMPLING METHOD: Hand auger and grab samples	LOGGED BY: P. Jeffers
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: G. Rees / REG. NO.: 6612

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				Surface Elevation: 558.64 ft msl (NAVD 88)		
				~4" asphalt		Lithology assessed from visual observation of boring sidewalls and cuttings
1	PSZB-86-1			POORLY GRADED GRAVEL with SAND (GP): dark brown (7.5YR 3/4), moist, ~70% gravel, ~30% medium to coarse sand		1' and 2.5' samples collected from sidewalls of boring; 5' sample collected using a hand auger
2						
3	PSZB-86-2.5					
4						
5	PSZB-86-5			Bottom of boring at 5 ft bgs		Boring backfilled with bentonite chips and continuously hydrated
6						Surface patched with asphalt
7						
8						
9						
10						
11						
12						
13						
14						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PSZB-87

BORING LOCATION: Northrop Grumman

ELEVATION AND DATUM: 559.20 ft msl (NAVD 88)

DRILLING CONTRACTOR: WDC Exploration & Wells

DATE STARTED: 4/20/07 | DATE FINISHED: 4/20/07

DRILLING METHOD: Air Knife

TOTAL DEPTH (ft.): 5.00 | MEASURING POINT: Ground surface

DRILLING EQUIPMENT: John Deere Power Tech compressor

DEPTH TO WATER	FIRST	COMPL.	24 HRS.
	NA	NA	NA

SAMPLING METHOD: Hand auger and grab samples

LOGGED BY: P. Jeffers

HAMMER WEIGHT: NA | DROP: NA

RESPONSIBLE PROFESSIONAL: G. Rees | REG. NO. 6612

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION	PID READING (ppm)	REMARKS
				Surface Elevation: 559.20 ft msl (NAVD 88)		
				~4" asphalt		
1	PSZB-87-1			*POORLY GRADED GRAVEL* with *SAND* (GP): dark brown (7.5YR 3/4), moist, ~60% gravel, ~40% medium to coarse sand		Lithology assessed from visual observation of boring sidewalls and cuttings
2						1' and 2.5' samples collected from sidewalls of boring; 5' sample collected using a hand auger
3	PSZB-87-2.5					
4						
5	PSZB-87-5			Bottom of boring at 5 ft bgs		Boring backfilled with bentonite chips and continuously hydrated
6						Surface patched with asphalt
7						
8						
9						
10						
11						
12						
13						
14						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA Azusa and Irwindale, California	**Log of Boring No. PIZB-7**			
BORING LOCATION: Former PerkinElmer	ELEVATION AND DATUM: 569.46 ft msl (NAVD 88)			
DRILLING CONTRACTOR: WDC Exploration & Wells	DATE STARTED: 4/3/07		DATE FINISHED: 4/3/07	
DRILLING METHOD: Air Rotary Casing Hammer with STRATEX	TOTAL DEPTH (ft.): 100.00		MEASURING POINT: Ground surface	
DRILLING EQUIPMENT: STAR50K-CH	DEPTH TO WATER	FIRST NA	COMPL. NA	24 HRS. NA
SAMPLING METHOD: Cuttings from cyclone	LOGGED BY: P. Jeffers			
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: G. Rees			REG. NO. 6612

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				Surface Elevation: 569.46 ft msl (NAVD 88)		
				~4" asphalt		Air knifed to ~1 foot below ground surface (bgs) by WDC Encountered buried concrete slab at 13" bgs Break slab refusal with hand auger on cobbles *Lithology assessed from* cuttings collected through the cyclone Drilled to 100' bgs using 10" casing and bit, begin collecting samples at 45' bgs
1				POORLY GRADED GRAVEL with SAND (GP): brown (7.5YR 4/3), moist, ~75% gravel, ~25% fine to coarse sand, trace fines		
2						
3						
4						
4				light gray (Gley 7/1), ~70% gravel, ~30% fine to coarse sand		
5						
6						
7						
8						
9						
9				~85% gravel, ~15% fine to coarse sand		
10						
11						
12						
13						
14						
15						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PIZB-7 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
16				POORLY GRADED GRAVEL with SAND (GP): continued		
17				~80% gravel, ~20% fine to coarse sand		
18						
19						
20						
21						
22						
23						
24						
25						
26						
27				POORLY GRADED SAND with GRAVEL (SP): brown (10YR 5/3), moist, ~70% fine to coarse sand, ~30% gravel		
28						
29						
30						
31						
32				~80% fine to coarse sand, ~20% gravel		
33						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PIZB-7 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
34				POORLY GRADED SAND with GRAVEL (SP): continued		
35						
36						
37						
38				~85% fine to coarse sand, ~15% gravel		
39						
40						
41						
42				POORLY GRADED GRAVEL with SAND (GP): light gray (Gley 7/1), moist, ~80% gravel, ~20% fine to coarse sand		
43						
44						
45	PIZB -7-45					
46				POORLY GRADED SAND with GRAVEL (SP): brown (10YR 5/3), moist, ~75% fine to coarse sand, ~25% gravel		
47						
48						
49						
50	PIZB -7-50					
51						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PIZB-7 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
52				POORLY GRADED SAND with GRAVEL (SP): continued		
53						
54						
55						
56						
57						
58						
59						
60	PIZB -7-60			very pale brown (10YR 7/3), ~60% fine to coarse sand, ~40% gravel		
61						
62						
63						
64						
65						
66						
67						
68						
69						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PIZB-7 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
70	PIZB-7-70			~80% fine to coarse sand, ~20% gravel		
71						
72						
73						
74						
75						
76						
77						
78						
79						
80	PIZB-7-80					
81						
82						
83						
84						
85						
86						
87						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PIZB-7 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
88				POORLY GRADED SAND with GRAVEL (SP): continued		
89						
90	PIZB-7-90	■		~70% fine to coarse sand, ~30% gravel		
91						
92						
93						
94						
95						
96						
97						
98						
99						
100	PIZB-7-100	■		Bottom of boring at 100 ft bgs		Boring backfilled with high solids bentonite grout Surface patched with asphalt
101						
102						
103						
104						
105						
106						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA Azusa and Irwindale, California	**Log of Boring No. PDZB-18**
BORING LOCATION: Former PerkinElmer	ELEVATION AND DATUM: 568.13 ft msl (NAVD 88)
DRILLING CONTRACTOR: WDC Exploration & Wells	DATE STARTED: 3/26/07 / DATE FINISHED: 3/29/07
DRILLING METHOD: Air Rotary Casing Hammer with STRATEX	TOTAL DEPTH (ft.): 250.00 / MEASURING POINT: Ground surface
DRILLING EQUIPMENT: STAR50K-CH	DEPTH TO WATER: FIRST NA / COMPL. NA / 24 HRS. NA
SAMPLING METHOD: Cuttings from cyclone	LOGGED BY: P. Jeffers/K. Zeiler
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: G. Rees / REG. NO. 6612

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION	PID READING (ppm)	REMARKS
				Surface Elevation: 568.13 ft msl (NAVD 88)		
				~6" asphalt		Hand augered to 1.5 feet below ground surface (bgs) Refusal on cobbles
1				POORLY GRADED GRAVEL with SAND (GP): dark brown (7.5YR 3/2), moist, ~70% gravel, ~30% fine to medium sand		
2						Lithology assessed from cuttings collected through the cyclone
3						Drilled to 250' bgs using 10" casing and bit, begin collecting samples at 110' bgs
4						
5						
6						
7						
8						
9						
10				~75% gravel, ~25% fine to coarse sand		
11						
12						
13						
14						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-18 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				POORLY GRADED GRAVEL with SAND (GP): continued		
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30				~65% gravel, ~35% fine to coarse sand		
31						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-18 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				POORLY GRADED GRAVEL with SAND (GP): continued		
32						
33						
34						
35						
36						
37						
38						
39						
40						
41						
42						
43						
44						
45						
46						
47						
48						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-18 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				POORLY GRADED GRAVEL with SAND (GP): continued		
49						
50				~80% gravel, ~20% fine to coarse sand		
51						
52						
53						
54						
55						
56						
57						
58						
59						
60						
61						
62						
63						
64						
65						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-18 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				POORLY GRADED GRAVEL with SAND (GP): continued		
66						
67						
68						
69						
70				~70% gravel, ~30% fine to coarse sand		
71						
72						
73						
74						
75						
76						
77						
78						
79						
80				~65% gravel, ~35% fine to coarse sand		
81						
82						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-18 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				POORLY GRADED GRAVEL with SAND (GP): continued		
83						
84						
85						
86						
87						
88						
89						
90				~85% gravel, ~15% fine to coarse sand		
91						
92						
93						
94						
95						
96						
97						
98						
99						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-18 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
100				POORLY GRADED GRAVEL with SAND (GP): continued		
101						
102						
103						
104						
105						
106						
107						
108						
109						
110	PDZB 18-110			~75% gravel, ~25% fine to coarse sand		
111						
112						
113						
114						
115				POORLY GRADED SAND with GRAVEL (SP): grayish brown (10YR 5/2), moist, ~75% fine to coarse sand, ~25% angular gravel, trace fines		
116						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-18 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
117				POORLY GRADED SAND with GRAVEL (SP): continued		
118						
119						
120	PDZB 18-120					
121						
122						
123						
124						
125				POORLY GRADED GRAVEL with SAND (GP): yellowish brown (10YR 5/4), moist, ~70% rounded to subangular gravel, ~30% fine to coarse sand, trace fines		
126						
127						
128						
129						
130	PDZB 18-130					
131						
132						
133						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-18 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
134				POORLY GRADED GRAVEL with SAND (GP): continued		
135						
136						
137						
138						
139						
140	PDZB 18-140			~75% gravel, ~20% fine to coarse sand, ~5% nonplastic fines		
141						
142						
143						
144						
145				POORLY GRADED SAND with GRAVEL (SP): grayish brown (10YR 5/2), moist, ~80% fine to coarse sand, ~20% angular gravel, trace fines		
146						
147						
148						
149						
150						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-18 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
	PDZB-18-150			POORLY GRADED SAND with GRAVEL (SP): continued		
151						
152						
153						
154						
155				POORLY GRADED GRAVEL with SAND (GP): brown (7.5YR 5/2), moist, ~70% subangular to subrounded gravel, ~30% fine to coarse sand, trace fines		
156						
157						
158						
159						
160	PDZB-18-160					
161						
162						
163						
164						
165						
166						
167						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-18 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
168				POORLY GRADED GRAVEL with SAND (GP): continued		
169						
170	PDZB 18-170			~85% gravel, ~15% fine to coarse sand, trace fines		
171						
172						
173						
174						
175				POORLY GRADED GRAVEL (GP): dark grayish brown (10YR 4/2), moist, ~95% angular gravel, ~5% fine to coarse sand, trace fines		Freshly broken gravel-size fragments
176						
177						
178						
179						
180	PDZB 18-180					
181						
182						
183						
184						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-18 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
185				POORLY GRADED GRAVEL (GP): continued		
186						
187						
188						
189						
190	PDZB 18-190					Freshly broken gravel-size fragments
191						
192						
193						
194						
195				POORLY GRADED GRAVEL with SAND (GP): dark grayish brown (10YR 4/2), moist, ~85% gravel, ~15% fine to coarse sand, trace fines		
196						
197						
198						
199						
200	PDZB 18-200					
201						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-18 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
202				POORLY GRADED GRAVEL with SAND (GP): continued		
203						
204						
205				POORLY GRADED SAND with GRAVEL (SP): dark brown (7.5YR 3/3), moist, ~65% fine to coarse sand, ~35% fine gravel, trace fines		
206						
207						
208						
209						
210	PDZB 18-210					
211						
212						
213						
214						
215				POORLY GRADED GRAVEL (GP): grayish brown (10YR 5/2), moist, ~95% gravel, ~5% fine to coarse sand, trace fines		
216						
217						
218						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-18 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
219				POORLY GRADED GRAVEL (GP): continued		
220	PDZB 18-220					
221						
222						
223						
224						
225				POORLY GRADED GRAVEL with SAND (GP): gray (10YR 5/1), moist, ~65% gravel, ~35% fine to coarse sand, trace fines		
226						
227						
228						
229						
230	PDZB 18-230					
231						
232						
233						
234						
235						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-18 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
236				POORLY GRADED GRAVEL (GP): brown (7.5YR 4/3), moist, ~90% gravel, ~10% fine to coarse sand, trace fines		
237						
238						
239						
240	PDZB-18-240					
241						
242						
243						
244						
245				POORLY GRADED GRAVEL with SAND (GP): brown (7.5YR 4/2), moist, ~70% gravel, ~30% fine to coarse sand, trace fines		
246						
247						
248						
249						
250	PDZB-18-250			Bottom of boring at 250 ft bgs		Boring backfilled with high solids bentonite grout using drill casing as a tremie pipe Surface patched with asphalt
251						
252						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA Azusa and Irwindale, California	**Log of Boring No. PDZB-19**
BORING LOCATION: Former PerkinElmer	ELEVATION AND DATUM: 566.59 ft msl (NAVD 88)
DRILLING CONTRACTOR: WDC Exploration & Wells	DATE STARTED: 3/30/07 / DATE FINISHED: 3/30/07
DRILLING METHOD: Air Rotary Casing Hammer with STRATEX	TOTAL DEPTH (ft.): 250.00 / MEASURING POINT: Ground surface
DRILLING EQUIPMENT: STAR50K-CH	DEPTH TO WATER: FIRST NA / COMPL. NA / 24 HRS. NA
SAMPLING METHOD: Cuttings from cyclone	LOGGED BY: K. Zeiler
HAMMER WEIGHT: NA / DROP: NA	RESPONSIBLE PROFESSIONAL: G. Rees / REG. NO. 6612

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				Surface Elevation: 566.59 ft msl (NAVD 88)		
				~4" asphalt		Hand augered to 1.5 feet below ground surface (bgs) Refusal on cobbles
1				POORLY GRADED GRAVEL with SAND (GP): dark olive gray (5Y 3/2), moist, ~70% fine to medium gravel, ~30% fine to coarse sand, trace fines		Lithology assessed from cuttings collected through the cyclone
2						Drilled to 250' bgs using 10" casing and bit, begin collecting samples at 110' bgs
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-19 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				POORLY GRADED GRAVEL with SAND (GP): continued		
20				~85% gravel, ~15% fine to coarse sand, trace fines		
30				~75% gravel, ~25% fine to coarse sand, trace fines		Freshly broken gravel-size fragments

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-19 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				POORLY GRADED GRAVEL with SAND (GP): continued		
32						
33						
34						
35						
36						
37						
38						
39						
40				~85% gravel, ~15% fine to coarse sand, trace fines		
41						
42						
43						
44						
45						
46						
47						
48						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-19 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				POORLY GRADED GRAVEL with SAND (GP): continued		
49						
50				~80% gravel, ~20% fine to coarse sand, trace fines		Freshly broken gravel-size fragments
51						
52						
53						
54						
55						
56						
57						
58						
59						
60				grayish brown (10YR 5/2), ~55% gravel, ~45% fine to coarse sand, trace fines		
61						
62						
63						
64						
65						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-19 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, *cementation, react. w/HCl, geo. inter.*	PID READING (ppm)	REMARKS
				POORLY GRADED GRAVEL with SAND (GP): continued		
66						
67						
68						
69						
70				~70% gravel, ~30% fine to coarse sand, trace fines		
71						
72						
73						
74						
75						
76						
77						
78						
79						
80				~60% gravel, ~40% fine to coarse sand, trace fines		
81						
82						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-19 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				POORLY GRADED GRAVEL with SAND (GP): continued		
83						
84						
85						
86						
87						
88						
89						
90				~70% gravel, ~30% fine to coarse sand, trace fines		
91						
92						
93						
94						
95						
96						
97						
98						
99						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-19 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				POORLY GRADED GRAVEL with SAND (GP): continued		
100				~60% gravel, ~40% fine to coarse sand, trace fines		
101						
102						
103						
104						
105						
106						
107						
108						
109						
110	PDZB 19-110			~65% gravel, ~35% fine to coarse sand, trace fines		
111						
112						
113						
114						
115				POORLY GRADED SAND with GRAVEL (SP): brown (10YR 5/3), moist, ~60% fine to coarse sand, ~40% gravel, trace fines		
116						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-19 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				POORLY GRADED SAND with GRAVEL (SP): continued		
117						
118						
119						
120	PDZB 19-120					
121						
122						
123						
124						
125						
126						
127						
128						
129						
130	PDZB 19-130			~75% fine to coarse sand, ~25% gravel, trace fines		
131						
132						
133						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-19 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
134				POORLY GRADED SAND with GRAVEL (SP): continued		
135				POORLY GRADED GRAVEL with SAND (GP): dark brown (7.5YR 3/3), moist, ~80% gravel, ~20% fine to coarse sand, trace fines		
136						
137						
138						
139						
140	PDZB 19-140					
141						
142						
143						
144						
145						
146						
147						
148						
149						
150						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-19 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
151	PDZB-19-150			light brownish gray (10YR 6/2), ~80% gravel, ~20% fine to coarse sand, trace fines		
152						
153						
154						
155						
156						
157						
158						
159						
160	PDZB-19-160			~70% gravel, ~30% fine to coarse sand		
161						
162						
163						
164						
165						
166						
167						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-19 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
168				POORLY GRADED GRAVEL with SAND (GP): continued		
169						
170	PDZB 19-170			dark yellowish brown (10YR 4/6), ~60% gravel, ~40% fine to coarse sand, trace fines		
171						
172						
173						
174						
175						
176						
177						
178						
179						
180	PDZB 19-180			~85% gravel, ~15% fine to coarse sand, trace fines		
181						
182						
183						
184						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-19 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				POORLY GRADED GRAVEL with SAND (GP): continued		
185				POORLY GRADED SAND with GRAVEL (SP): dark grayish brown (10YR 4/2), moist, ~80% fine to coarse sand, ~20% gravel, trace fines		
186						
187						
188						
189						
190	PDZB 19-190					
191						
192						
193						
194						
195						
196						
197						
198						
199						
200	PDZB 19-200			~55% fine to coarse sand, ~45% gravel		
201						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-19 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
202				POORLY GRADED SAND with GRAVEL (SP): continued		
203						
204						
205				POORLY GRADED GRAVEL with SAND (GP): brown (10YR 4/3), moist, ~70% gravel, ~30% fine to coarse sand, trace fines		
206						
207						
208						
209						
210	PDZB-19-210					
211						
212						
213						
214						
215				POORLY GRADED SAND with GRAVEL (SP): grayish brown (10YR 5/2), moist, ~80% fine to coarse sand, ~20% gravel, trace fines		
216						
217						
218						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-19 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
219				POORLY GRADED SAND with GRAVEL (SP): continued		
220	PDZB 19-220					
221						
222						
223						
224						
225				POORLY GRADED GRAVEL with SAND (GP): grayish brown (10YR 5/2), moist, ~85% gravel, ~15% fine to coarse sand, trace fines		
226						
227						
228						
229						
230	PDZB 19-230					
231						
232						
233						
234						
235						

RMRK3

PROJECT: AZUSA/IRWINDALE STUDY AREA
Azusa and Irwindale, California

Log of Boring No. PDZB-19 (cont'd)

DEPTH (feet)	SAMPLES: Sample No.	SAMPLES: Sample	SAMPLES: Blows/ 6 inches	DESCRIPTION: NAME (USCS): color, moist, % by wt., plast. density, structure, cementation, react. w/HCl, geo. inter.	PID READING (ppm)	REMARKS
				POORLY GRADED GRAVEL with SAND (GP): continued		
236						
237						
238						
239						
240	PDZB-19-240			dark brown (7.5YR)		
241						
242						
243						
244						
245						
246						
247						
248						
249						
250	PDZB-19-250			grayish brown (10YR 5/2), ~55% gravel, ~45% fine to coarse sand, trace fines Bottom of boring at 250 ft bgs		Boring backfilled with high solids bentonite grout using drill casing as a tremie pipe Surface patched with asphalt
251						
252						

RMRK3

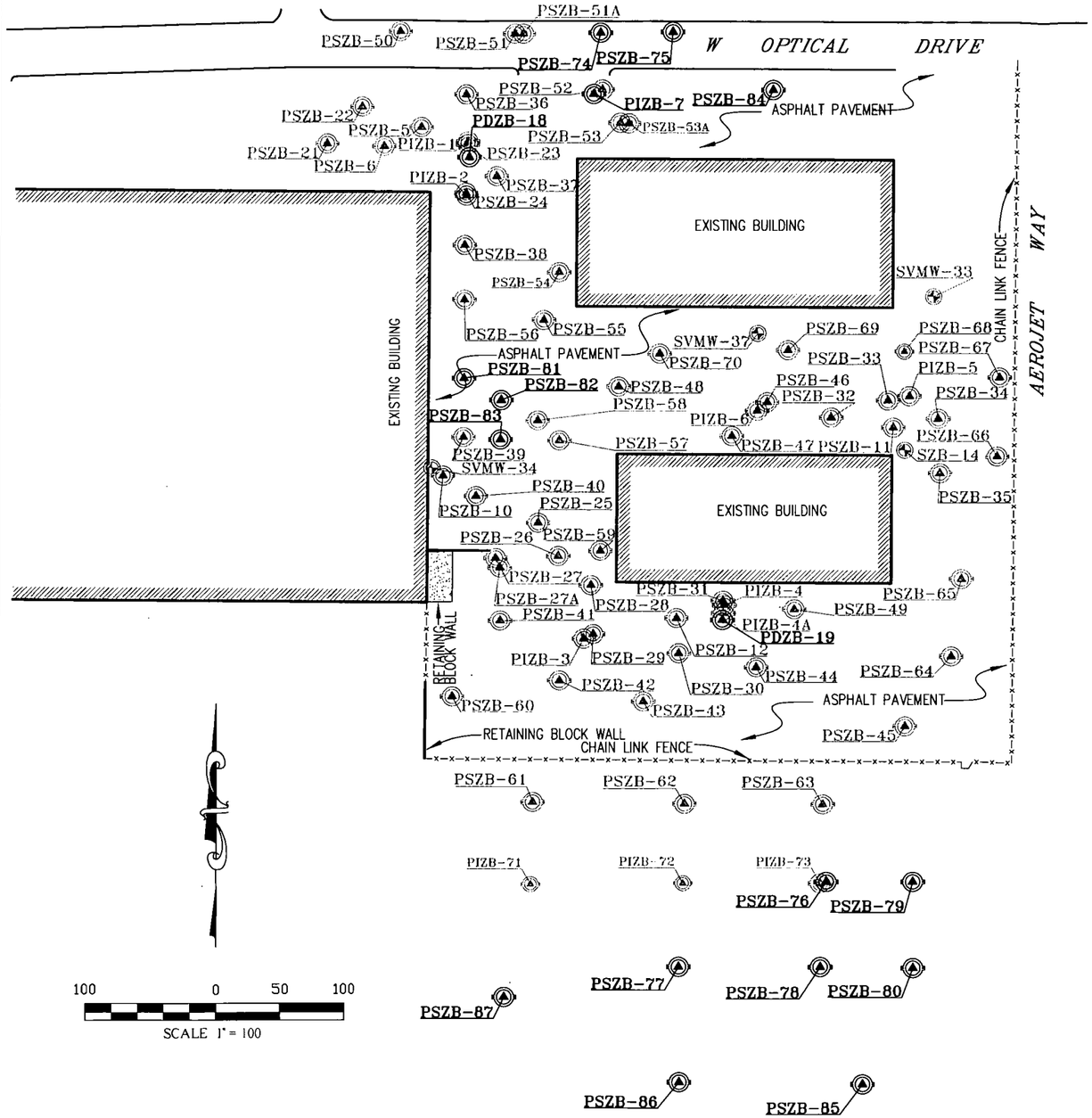
APPENDIX B

SURVEY DATA

SITE PLAN

BORE HOLE & VAPOR WELL LOCATIONS

AEROJET - 1300 W OPTICAL DRIVE, AZUSA, CA 91702



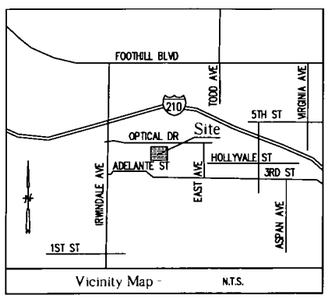
DATE OF SURVEY: APRIL 17, 2007

BORE HOLES

WELL	NORTH	EAST	LATITUDE (DD)	LONGITUDE (DD)	FS (ELEVATION)
PSZB-74	1869216.30	6583298.84	34.1286726	-117.9285207	571.35
PSZB-75	1869216.79	6583353.94	34.1286739	-117.9283386	571.76
PSZB-84	1869171.76	6583430.90	34.1285500	-117.9280844	570.81
PIZB-7	1869168.82	6583293.72	34.1285422	-117.9285377	569.46
PDZB-18	1869120.10	6583198.43	34.1284085	-117.9288527	568.13
PSZB-81	1868948.07	6583194.75	34.1279358	-117.9288653	564.91
PSZB-82	1868930.78	6583223.35	34.1278882	-117.9287708	564.83
PSZB-83	1868900.01	6583222.84	34.1278037	-117.9287726	564.47
PDZB-19	1868758.96	6583392.86	34.1274158	-117.9282111	566.59
PSZB-87	1868464.06	6583226.24	34.1266057	-117.9287624	559.20
PSZB-86	1868398.14	6583360.63	34.1264243	-117.9283184	558.64
PSZB-77	1868487.75	6583359.87	34.1266706	-117.9283207	560.78
PSZB-76	1868553.94	6583472.97	34.1268522	-117.9279469	563.39
PSZB-79	1868554.00	6583538.83	34.1268523	-117.9277293	564.34
PSZB-80	1868486.86	6583539.19	34.1266678	-117.9277282	563.15
PSZB-78	1868487.56	6583468.61	34.1266698	-117.9279615	562.04
PSZB-85	1868396.33	6583500.89	34.1264191	-117.9278550	560.87

Legend

BORE HOLE		FS	FINISH SURFACE
CHAIN LINK FENCE		TOC	TOP OF CASING
CONCRETE		TOR	TOP OF RIM
		VW	VAPOR WELL



DATES OF SURVEY

APRIL 20, 2005
FEBRUARY 21, 2006
MARCH 17, 2006
MARCH 29, 2006
APRIL 17, 2007

BENCH MARK

THE ELEVATIONS SHOWN HEREON ARE BASED UPON THE NGS MONUMENT EV9357, ELEVATION = 687.00 FEET (NAVD 88)

COORDINATES

THE COORDINATES SHOWN HEREON ARE BASED UPON THE STATE PLANE COORDINATE SYSTEM OF 1983 (NAD 83), CALIFORNIA ZONE V.

PREPARED FOR

GEOMATRIX COUNSULTANT, INC.
250 E. RINCON STREET, SUITE 240
CORONA, CA 92829
PHONE (951) 273-7400
FAX (951) 273-7420

NO.	DATE	REVISIONS	BY
	04-25-05	SUBMITTAL	MN
1	02-22-06	ADD BORE HOLES	MN
2	03-20-06	ADD BORE HOLES & WELLS	MN
3	03-24-06	CLIENT'S COMMENTS	MN
4	03-31-06	ADD BORE HOLES	MN
5	04-26-07	ADD BORE HOLES	GBM

CALVADA SURVEYING, INC.
411 Jenks Cir., Suite 205, Corona, CA 92880
Phone: 951-280-9960 Fax: 951-280-9746
Toll Free: 800-CALVADA www.calvada.com

JOB NO. 05191

SHEET 1 OF 1

APPENDIX C

LABORATORY REPORTS AND CHAIN-OF-CUSTODY FORMS

Calscience
Environmental
Laboratories, Inc.

Supplemental Report 1

April 05, 2007

The original report has been revised/corrected.

Rick Rees
Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Subject: **Calscience Work Order No.:** **07-03-1700**
Client Reference: **AEROJET-AISA PERKIN ELMER AOC**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 3/27/2007 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Don Burley
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Date Received:	03/27/07
Work Order No:	07-03-1700
Preparation:	Cartridge
Method:	EPA 314.0M

Project: AEROJET-AISA PERKIN ELMER AOC

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-18-110	**07-03-1700-1**	**03/27/07**	**Solid**	**IC 6**	**03/28/07**	**04/02/07**	**070402L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	124	20.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-18-120	**07-03-1700-2**	**03/27/07**	**Solid**	**IC 6**	**03/28/07**	**04/02/07**	**070402L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	44.5	20.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	**099-05-205-243**	**N/A**	**Solid**	**IC 6**	**03/28/07**	**04/02/07**	**070402L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	20.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.		Date Received:	03/27/07
250 East Rincon Street, Suite 204		Work Order No:	07-03-1700
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA PERKIN ELMER AOC

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-18-110	**07-03-1700-1**	**03/27/07**	**Solid**	**LC/MS 1**	**03/28/07**	**04/02/07**	**070330L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	130	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-18-120	**07-03-1700-2**	**03/27/07**	**Solid**	**LC/MS 1**	**03/28/07**	**04/02/07**	**070330L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	51	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-18-130	**07-03-1700-3**	**03/27/07**	**Solid**	**LC/MS 1**	**03/28/07**	**04/02/07**	**070330L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	140	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-18-140	**07-03-1700-4**	**03/27/07**	**Solid**	**LC/MS 1**	**03/28/07**	**04/02/07**	**070330L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	100	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-18-150	**07-03-1700-5**	**03/27/07**	**Solid**	**LC/MS 1**	**03/28/07**	**04/02/07**	**070330L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	38	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	**099-12-496-6**	**N/A**	**Solid**	**LC/MS 1**	**03/28/07**	**04/03/07**	**070330L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Geomatrix Consultants, Inc. 250 East Rincon Street, Suite 204 Corona, CA 92879-1363	Date Received: 03/27/07 Work Order No: 07-03-1700 Preparation: Cartridge Method: EPA 314.0M

Project AEROJET-AISA PERKIN ELMER AOC

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
PDZB-18-120	**Solid**	**IC 6**	**03/28/07**	**04/02/07**	**070402S02**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	103	103	80-120	0	0-15	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Geomatrix Consultants, Inc. 250 East Rincon Street, Suite 204 Corona, CA 92879-1363	Date Received: Work Order No: Preparation: Method:	03/27/07 07-03-1700 Cartridge EPA 6850

Project AERojet-AISA PERKIN ELMER AOC

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
PDZB-18-150	**Solid**	**LC/MS 1**	**03/28/07**	**04/02/07**	**070330S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	84	79	50-150	4	0-30	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Geomatrix Consultants, Inc.	Date Received:	N/A
250 East Rincon Street, Suite 204	Work Order No:	07-03-1700
Corona, CA 92879-1363	Preparation:	Cartridge
	Method:	EPA 314.0M

Project: AEROJET-AISA PERKIN ELMER AOC

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-05-205-243	Solid	IC 6	03/28/07	04/02/07	070402L02

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	97	99	85-115	1	0-15	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Geomatrix Consultants, Inc.	Date Received:	N/A
250 East Rincon Street, Suite 204	Work Order No:	07-03-1700
Corona, CA 92879-1363	Preparation:	Cartridge
	Method:	EPA 6850

Project: AEROJET-AISA PERKIN ELMER AOC

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-496-6	**Solid**	**LC/MS 1**	**03/28/07**	**04/03/07**	**070330L01**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	102	101	60-140	1	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 07-03-1700

Qualifier	Definition
*	See applicable analysis comment.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike or Matrix Spike Duplicate compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported with no further corrective action required.
A	Result is the average of all dilutions, as defined by the method.
B	Analyte was present in the associated method blank.
C	Analyte presence was not confirmed on primary column.
E	Concentration exceeds the calibration range.
H	Sample received and/or analyzed past the recommended holding time.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
N	Nontarget Analyte.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
U	Undetected at the laboratory method detection limit.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

CHAIN OF-CUSTODY RECORD

COR 11105

PROJECT NAME: AEROJET-AISA PERKIN ELMER AOC				DATE: 3/27/07	PAGE 1 OF 1
PROJECT NUMBER: 7190.005 1.7	LABORATORY NAME: CALSCIENCE	CLIENT INFORMATION: AEROJET-AISA		REPORTING REQUIREMENTS:	
RESULTS TO: G. RICHARD REES	LABORATORY ADDRESS: 7440 LINCOLN WAY				
TURNAROUND TIME: STANDARD	GARDEN GROVE CA 92841				
SAMPLE SHIPMENT METHOD: COURIER	LABORATORY CONTACT: DON BURLY			GEOTRACKER REQUIRED YES NO	
	LABORATORY PHONE NUMBER: 714-895-5494			SITE SPECIFIC GLOBAL ID NO.	

SAMPLERS (SIGNATURE):

DATE	TIME	SAMPLE NUMBER	ANALYSES: EPA 6850	ANALYSES: EPA 314	CONTAINER TYPE AND SIZE	Soil (S), Water (W), Vapor (V), or Other (O)	Filtered	Preservative Type	Cooled	MS/MSD	No. of Containers	ADDITIONAL COMMENTS
3/27/07	10:32	PDZB-18-110	X	X	40Z GLASS JAR	S			X		1	
3/27/07	10:50	PDZB-18-120	X	X	" " "	S			X		1	
3/27/07	11:04	PDZB-18-130	X		" " "	S			X		1	
3/27/07	11:37	PDZB-18-140	X		" " "	S			X		1	
3/27/07	11:55	PDZB-18-150	X		" " "	S			X		1	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
SIGNATURE:	3/27/07	14:17	SIGNATURE:	03/27/07	1417
PRINTED NAME: KURT R ZEILER			PRINTED NAME: Keith B Boyer		
COMPANY: GEOMATRIX			COMPANY: Cal Science		
SIGNATURE:	3/27/07	1557	SIGNATURE:	3/27/07	1557
PRINTED NAME: Keith B Boyer			PRINTED NAME: MARLON CONTRERAS		
COMPANY: Cal Science			COMPANY: CSL		
SIGNATURE:			SIGNATURE:		
PRINTED NAME:			PRINTED NAME:		
COMPANY:			COMPANY:		

TOTAL NUMBER OF CONTAINERS: 5

SAMPLING COMMENTS:

250 East Rincon Street, Suite 204
Corona, California 92879-1363
Tel 951.273.7400 Fax 951.273.7420

Geomatrix

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 07 - 03 - 1700

Cooler 1 of 1

SAMPLE RECEIPT FORM

CLIENT: AEROJET - ASIA DATE: 3-27-07

TEMPERATURE – SAMPLES RECEIVED BY:

CALSCIENCE COURIER:

_____ Chilled, cooler with temperature blank provided.
_____ Chilled, cooler without temperature blank.
_____ Chilled and placed in cooler with wet ice.
_____ Ambient and placed in cooler with wet ice.
_____ Ambient temperature.

_____ °C Temperature blank.

LABORATORY (Other than Calscience Courier):

_____ °C Temperature blank.
4.9 °C IR thermometer.
_____ Ambient temperature.

Initial: dvc

CUSTODY SEAL INTACT:

Sample(s): _____ Cooler: _____ No (Not Intact) : _____ Not Present: ✓

Initial: dvc

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody document(s) received with samples	✓		
Sampler's name indicated on COC	✓		
Sample container label(s) consistent with custody papers	✓		
Sample container(s) intact and good condition	✓		
Correct containers and volume for analyses requested	✓		
Proper preservation noted on sample label(s)			✓
VOA vial(s) free of headspace.			✓
Tedlar bag(s) free of condensation			✓

Initial: dvc

COMMENTS:

Calscience
Environmental
Laboratories, Inc.

Supplemental Report 1

April 05, 2007

The original report has been revised/corrected.

Rick Rees
Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Subject: **Calscience Work Order No.:** **07-03-1808**
Client Reference: **AEROJET-AISA PERKIN ELMER AOC**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 3/28/2007 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Don Burley
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.		Date Received:	03/28/07
250 East Rincon Street, Suite 204		Work Order No:	07-03-1808
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA PERKIN ELMER AOC

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-79-1	**07-03-1808-1**	**03/28/07**	**Solid**	**LC/MS 1**	**03/28/07**	**04/02/07**	**070330L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	6.5	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-79-2.5	**07-03-1808-2**	**03/28/07**	**Solid**	**LC/MS 1**	**03/28/07**	**04/02/07**	**070330L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	23	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-18-160	**07-03-1808-3**	**03/28/07**	**Solid**	**LC/MS 1**	**03/28/07**	**04/02/07**	**070330L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	32	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-79-5	**07-03-1808-4**	**03/28/07**	**Solid**	**LC/MS 1**	**03/28/07**	**04/02/07**	**070330L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-18-170	**07-03-1808-5**	**03/28/07**	**Solid**	**LC/MS 1**	**03/28/07**	**04/02/07**	**070330L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	22	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-80-1	**07-03-1808-6**	**03/28/07**	**Solid**	**LC/MS 1**	**03/28/07**	**04/02/07**	**070330L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Date Received: 03/28/07
Work Order No: 07-03-1808
Preparation: Cartridge
Method: EPA 6850

Project: AEROJET-AISA PERKIN ELMER AOC

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-80-2.5	**07-03-1808-7**	**03/28/07**	**Solid**	**LC/MS 1**	**03/28/07**	**04/02/07**	**070330L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-80-5	**07-03-1808-8**	**03/28/07**	**Solid**	**LC/MS 1**	**03/28/07**	**04/02/07**	**070330L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	**099-12-496-6**	**N/A**	**Solid**	**LC/MS 1**	**03/28/07**	**04/03/07**	**070330L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Geomatrix Consultants, Inc.	Date Received: 03/28/07
250 East Rincon Street, Suite 204	Work Order No: 07-03-1808
Corona, CA 92879-1363	Preparation: Cartridge
	Method: EPA 6850

Project AEROJET-AISA PERKIN ELMER AOC

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
07-03-1700-5	**Solid**	**LC/MS 1**	**03/28/07**	**04/02/07**	**070330S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	84	79	50-150	4	0-30	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Geomatrix Consultants, Inc.	Date Received:	N/A
250 East Rincon Street, Suite 204	Work Order No:	07-03-1808
Corona, CA 92879-1363	Preparation:	Cartridge
	Method:	EPA 6850

Project: AEROJET-AISA PERKIN ELMER AOC

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-496-6	**Solid**	**LC/MS 1**	**03/28/07**	**04/03/07**	**070330L01**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	102	101	60-140	1	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 07-03-1808

Qualifier	Definition
*	See applicable analysis comment.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike or Matrix Spike Duplicate compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported with no further corrective action required.
A	Result is the average of all dilutions, as defined by the method.
B	Analyte was present in the associated method blank.
C	Analyte presence was not confirmed on primary column.
E	Concentration exceeds the calibration range.
H	Sample received and/or analyzed past the recommended holding time.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
N	Nontarget Analyte.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
U	Undetected at the laboratory method detection limit.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

CHAIN-OF-CUSTODY RECORD

COR 11106

PROJECT NAME: AEROJET - AISA PERKINELMER AOC			DATE: 3/28/07 PAGE 1 OF 1
PROJECT NUMBER: 7190.005 1.7	LABORATORY NAME: CALSCIENCE	CLIENT INFORMATION: AEROJET-AISA	REPORTING REQUIREMENTS: 1808
RESULTS TO: G. RICHARD REES	LABORATORY ADDRESS: 7440 LINCOLN WAY		
TURNAROUND TIME: STANDARD	GARDEN GROVE CA 92841		
SAMPLE SHIPMENT METHOD: COURIER	LABORATORY CONTACT: DAN BURLY		GEOTRACKER REQUIRED YES (NO)
	LABORATORY PHONE NUMBER: 714-895-5494		SITE SPECIFIC GLOBAL ID NO.

SAMPLERS (SIGNATURE):

DATE	TIME	SAMPLE NUMBER	ANALYSES: EPA 6850	CONTAINER TYPE AND SIZE	Soil (S), Water (W), Vapor (V), or Other (O)	Filtered	Preservative Type	Cooled	MS/MSD	No. of Containers	ADDITIONAL COMMENTS
3/28/07	11:58	PSZB-79-1	X	4oz GLASS JAR	S			X		1	
3/28/07	12:00	PSZB-79-2.5	X	" " "	S			X		1	
3/28/07	12:36	PDZB-18-160	X	" " "	S			X		1	
3/28/07	12:45	PSZB-79-5	X	" " "	S			X		1	
3/28/07	13:10	PDZB-18-170	X	" " "	S			X		1	
3/28/07	15:54	PSZB-80-1	X	" " "	S			X		1	
3/28/07	15:56	PSZB-80-2.5	X	" " "	S			X		1	
3/28/07	16:11	PSZB-80-5	X	" " "	S			X		1	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
SIGNATURE:	3/28/07	14:27	SIGNATURE:	3/28/07	14:27
PRINTED NAME: KURT ZEILER			PRINTED NAME: ALEX MARQUEZ		
COMPANY: GEOMATRIX			COMPANY: CALSCIENCE		
SIGNATURE:	3/28/07	17:50	SIGNATURE:		1700
PRINTED NAME: ALEX MARQUEZ			PRINTED NAME:		
COMPANY:			COMPANY: CEL	03.28.07	
SIGNATURE:			SIGNATURE:		
PRINTED NAME:			PRINTED NAME:		
COMPANY:			COMPANY:		

TOTAL NUMBER OF CONTAINERS: 8

SAMPLING COMMENTS:

250 East Rincon Street, Suite 204
Corona, California 92879-1363
Tel 951.273.7400 Fax 951.273.7420

Geomatrix

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 07 - 03 - 1808

Cooler 1 of 1

SAMPLE RECEIPT FORM

CLIENT: Geomatrix DATE: 3/28/07

TEMPERATURE – SAMPLES RECEIVED BY:

CALSCIENCE COURIER:

_____ Chilled, cooler with temperature blank provided.
✓ Chilled, cooler without temperature blank.
_____ Chilled and placed in cooler with wet ice.
_____ Ambient and placed in cooler with wet ice.
_____ Ambient temperature.
3.8 °C Temperature blank.

LABORATORY (Other than Calscience Courier):

_____ °C Temperature blank.
_____ °C IR thermometer.
_____ Ambient temperature.

Initial: AM

CUSTODY SEAL INTACT:

Sample(s): _____ Cooler: _____ No (Not Intact) : _____ Not Present: ✓

Initial: AM

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody document(s) received with samples	✓		
Sampler's name indicated on COC	✓		
Sample container label(s) consistent with custody papers	✓		
Sample container(s) intact and good condition	✓		
Correct containers and volume for analyses requested	✓		
Proper preservation noted on sample label(s)			✓
VOA vial(s) free of headspace.			✓
Tedlar bag(s) free of condensation			✓

Initial: AM

COMMENTS:

Calscience
Environmental
Laboratories, Inc.

April 06, 2007

Rick Rees
Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Subject: **Calscience Work Order No.:** **07-03-1892**
Client Reference: **AEROJET-AISA PERKIN ELMER AOC**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 3/29/2007 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Don Burley
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.	Date Received: 03/29/07
250 East Rincon Street, Suite 204	Work Order No: 07-03-1892
Corona, CA 92879-1363	Preparation: Cartridge
	Method: EPA 6850

Project: AEROJET-AISA PERKIN ELMER AOC

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-18-180	**07-03-1892-1**	**03/29/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	19	6.0	1		ug/kg

PDZB-18-190	07-03-1892-2	03/29/07	Solid	LC/MS 1	03/30/07	04/06/07	070402L02

Parameter	Result	RL	DF	Qual	Units
Perchlorate	21	6.0	1		ug/kg

PDZB-18-200	07-03-1892-3	03/29/07	Solid	LC/MS 1	03/30/07	04/06/07	070402L02

Parameter	Result	RL	DF	Qual	Units
Perchlorate	15	6.0	1		ug/kg

PSZB-74-5	07-03-1892-6	03/29/07	Solid	LC/MS 1	03/30/07	04/06/07	070402L02

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

PSZB-74-2.5	07-03-1892-7	03/29/07	Solid	LC/MS 1	03/30/07	04/06/07	070402L02

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

PSZB-74-1	07-03-1892-8	03/29/07	Solid	LC/MS 1	03/30/07	04/06/07	070402L02

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.		Date Received:	03/29/07
250 East Rincon Street, Suite 204		Work Order No:	07-03-1892
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA PERKIN ELMER AOC

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-75-5	**07-03-1892-12**	**03/29/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	10	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-75-2.5	**07-03-1892-13**	**03/29/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-75-1	**07-03-1892-14**	**03/29/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	**099-12-496-8**	**N/A**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Geomatrix Consultants, Inc.	Date Received: 03/29/07
250 East Rincon Street, Suite 204	Work Order No: 07-03-1892
Corona, CA 92879-1363	Preparation: Cartridge
	Method: EPA 6850

Project AEROJET-AISA PERKIN ELMER AOC

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
PDZB-18-180	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402S02**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	74	54	50-150	24	0-30	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Geomatrix Consultants, Inc.		Date Received:	N/A
250 East Rincon Street, Suite 204		Work Order No:	07-03-1892
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA PERKIN ELMER AOC

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-496-8	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L02**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	100	94	60-140	6	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 07-03-1892

Qualifier	Definition
*	See applicable analysis comment.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike or Matrix Spike Duplicate compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported with no further corrective action required.
A	Result is the average of all dilutions, as defined by the method.
B	Analyte was present in the associated method blank.
C	Analyte presence was not confirmed on primary column.
E	Concentration exceeds the calibration range.
H	Sample received and/or analyzed past the recommended holding time.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
N	Nontarget Analyte.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
U	Undetected at the laboratory method detection limit.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

CHAIN OF CUSTODY RECORD (1892) COR 11107

PROJECT NAME: AEROJET-AISA PERKINELMER AOC			DATE: 3/29/07 PAGE 1 OF 1
PROJECT NUMBER: 7190.005 1.7	LABORATORY NAME: CALSCIENCE	CLIENT INFORMATION: AEROJET-AISA	REPORTING REQUIREMENTS:
RESULTS TO: G. RICHARD REES	LABORATORY ADDRESS: 7440 LINCOLN WAY		
TURNAROUND TIME: STANDARD	GARDEN GROVE CA 92841		
SAMPLE SHIPMENT METHOD: COURIER	LABORATORY CONTACT: DON BURLY		GEOTRACKER REQUIRED YES (NO)
	LABORATORY PHONE NUMBER: 714-895-5494		SITE SPECIFIC GLOBAL ID NO.

SAMPLERS (SIGNATURE):

	DATE	TIME	SAMPLE NUMBER	ANALYSES: EPA 6850	ANALYSES: HOLD	CONTAINER TYPE AND SIZE	Soil (S), Water (W), Vapor (V), or Other (O)	Filtered	Preservative Type	Cooled	MS/MSD	No. of Containers	ADDITIONAL COMMENTS
1	3/29/07	7:34	PDZB-18-180	X		4oz GLASS JAR	S			X		1	
2	3/29/07	7:51	PDZB-18-190	X		" " "	S			X		1	
3	3/29/07	8:09	PDZB-18-200	X		" " "	S			X		1	
4	3/29/07	8:45	PDZB-18-210	X	X	" " "	S			X		1	HOLD
5	3/29/07	8:57	PDZB-18-220	X	X	" " "	S			X		1	HOLD
6	3/29/07	9:11	PSZB-74-5	X		" " "	S			X		1	
7	3/29/07	9:13	PSZB-74-2.5	X		" " "	S			X		1	
8	3/29/07	9:15	PSZB-74-1	X		" " "	S			X		1	
9	3/29/07	9:18	PDZB-18-230	X	X	" " "	S			X		1	HOLD
10	3/29/07	9:33	PDZB-18-240	X	X	" " "	S			X		1	HOLD
11	3/29/07	9:53	PDZB-18-250	X	X	" " "	S			X		1	HOLD
12	3/29/07	12:09	PSZB-75-5	X		" " "	S			X		1	
13	3/29/07	12:11	PSZB-75-2.5	X		" " "	S			X		1	
14	3/29/07	12:13	PSZB-75-1	X		" " "	S			X		1	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
SIGNATURE:	3/29/07	14:47	SIGNATURE:	3/29/7	1447
PRINTED NAME: KURT ZEDER			PRINTED NAME: BAC TA		
COMPANY: GEOMATRIX			COMPANY: CEL		
SIGNATURE:	3/29/7	1600	SIGNATURE:	3/29/7	1600
PRINTED NAME: BAC TA			PRINTED NAME: Jasmine Vo		
COMPANY: CEL			COMPANY: CEL		
SIGNATURE:			SIGNATURE:		
PRINTED NAME:			PRINTED NAME:		
COMPANY:			COMPANY:		

TOTAL NUMBER OF CONTAINERS: 14

SAMPLING COMMENTS:

250 East Rincon Street, Suite 204
Corona, California 92879-1363
Tel 951.273.7400 Fax 951.273.7420

Geomatrix

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 07 - 03 - 1892

Cooler 1 of 1

SAMPLE RECEIPT FORM

CLIENT: Geomatrix DATE: 3/29/07

TEMPERATURE – SAMPLES RECEIVED BY:

CALSCIENCE COURIER:

- _____ Chilled, cooler with temperature blank provided.
- _____ Chilled, cooler without temperature blank.
- ✓ Chilled and placed in cooler with wet ice.
- _____ Ambient and placed in cooler with wet ice.
- _____ Ambient temperature.
- 9.0 °C Temperature blank.

LABORATORY (Other than Calscience Courier):

- _____ °C Temperature blank.
- _____ °C IR thermometer.
- _____ Ambient temperature.

Initial: [signature]

CUSTODY SEAL INTACT:

Sample(s): _____ Cooler: _____ No (Not Intact) : _____ Not Present: ✓

Initial: [signature]

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody document(s) received with samples	✓		
Sampler's name indicated on COC	✓		
Sample container label(s) consistent with custody papers	✓		
Sample container(s) intact and good condition	✓		
Correct containers and volume for analyses requested	✓		
Proper preservation noted on sample label(s)	✓		
VOA vial(s) free of headspace.	✓		
Tedlar bag(s) free of condensation			

Initial: [signature]

COMMENTS:

Calscience
Environmental
Laboratories, Inc.

Supplemental Report 2

May 23, 2007

The original report has been revised/corrected.

Rick Rees
Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Subject: **Calscience Work Order No.:** **07-03-2015**
Client Reference: **AEROJET-AISA PERKIN ELMER AOC**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 3/30/2007 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Don Burley
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.	Date Received: 03/30/07
250 East Rincon Street, Suite 204	Work Order No: 07-03-2015
Corona, CA 92879-1363	Preparation: Cartridge
	Method: EPA 314.0M

Project: AEROJET-AISA PERKIN ELMER AOC

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-19-210	**07-03-2015-18**	**03/30/07**	**Solid**	**IC 6**	**04/11/07**	**04/11/07**	**070411L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	250	20.0	1		ug/kg

Method Blank	**099-05-205-245**	**N/A**	**Solid**	**IC 6**	**04/11/07**	**04/11/07**	**070411L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	20.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.		Date Received:	03/30/07
250 East Rincon Street, Suite 204		Work Order No:	07-03-2015
Corona, CA 92879-1363		Preparation:	N/A
		Method:	EPA 314.0

Project: AEROJET-AISA PERKIN ELMER AOC

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
EQB20070329	**07-03-2015-1**	**03/29/07**	**Aqueous**	**IC 6**	**N/A**	**04/02/07**	**070402L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	3.0	1		ug/L

Method Blank	099-05-203-563	N/A	Aqueous	IC 6	N/A	04/02/07	070402L01

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	3.0	1		ug/L

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.		Date Received:	03/30/07
250 East Rincon Street, Suite 204		Work Order No:	07-03-2015
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA PERKIN ELMER AOC

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-77-5	**07-03-2015-2**	**03/30/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	14	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-77-2.5	**07-03-2015-3**	**03/30/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	89	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-77-1	**07-03-2015-4**	**03/30/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	220	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-19-110	**07-03-2015-5**	**03/30/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	71	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-19-120	**07-03-2015-6**	**03/30/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	21	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-19-130	**07-03-2015-7**	**03/30/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	160	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.	Date Received: 03/30/07
250 East Rincon Street, Suite 204	Work Order No: 07-03-2015
Corona, CA 92879-1363	Preparation: Cartridge
	Method: EPA 6850

Project: AEROJET-AISA PERKIN ELMER AOC

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-19-140	**07-03-2015-8**	**03/30/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	86	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-19-150	**07-03-2015-9**	**03/30/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	51	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-19-160	**07-03-2015-10**	**03/30/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	69	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-19-170	**07-03-2015-11**	**03/30/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	180	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-19-180	**07-03-2015-12**	**03/30/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	150	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-19-190	**07-03-2015-13**	**03/30/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	190	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.		Date Received:	03/30/07
250 East Rincon Street, Suite 204		Work Order No:	07-03-2015
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA PERKIN ELMER AOC

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-19-200	**07-03-2015-14**	**03/30/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	140	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-78-5	**07-03-2015-15**	**03/30/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-78-2.5	**07-03-2015-16**	**03/30/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	7.6	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-78-1	**07-03-2015-17**	**03/30/07**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	110	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-19-210	**07-03-2015-18**	**03/30/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L03**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	240	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-19-220	**07-03-2015-19**	**03/30/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L03**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	260	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.	Date Received:	03/30/07
250 East Rincon Street, Suite 204	Work Order No:	07-03-2015
Corona, CA 92879-1363	Preparation:	Cartridge
	Method:	EPA 6850

Project: AEROJET-AISA PERKIN ELMER AOC

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-19-230	**07-03-2015-20**	**03/30/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L03**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	320	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-19-240	**07-03-2015-21**	**03/30/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L03**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	690	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PDZB-19-250	**07-03-2015-22**	**03/30/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L03**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	510	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	**099-12-496-7**	**N/A**	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	**099-12-496-11**	**N/A**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L03**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Date Received: 03/30/07
Work Order No: 07-03-2015
Preparation: Cartridge
Method: EPA 314.0M

Project AEROJET-AISA PERKIN ELMER AOC

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
07-04-0686-1	**Solid**	**IC 6**	**04/11/07**	**04/11/07**	**070411S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	110	113	80-120	2	0-15	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Geomatrix Consultants, Inc. 250 East Rincon Street, Suite 204 Corona, CA 92879-1363	Date Received: Work Order No: Preparation: Method:	03/30/07 07-03-2015 N/A EPA 314.0

Project AEROJET-AISA PERKIN ELMER AOC

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
07-03-2025-4	**Aqueous**	**IC 6**	**N/A**	**04/02/07**	**070402S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	87	87	80-120	0	0-15	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Date Received: 03/30/07
Work Order No: 07-03-2015
Preparation: Cartridge
Method: EPA 6850

Project AEROJET-AISA PERKIN ELMER AOC

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
PDZB-19-190	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	84	49	50-150	13	0-30	3

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Geomatrix Consultants, Inc. 250 East Rincon Street, Suite 204 Corona, CA 92879-1363	Date Received: 03/30/07 Work Order No: 07-03-2015 Preparation: Cartridge Method: EPA 6850

Project AERojet-AISA PERKIN ELMER AOC

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
PDZB-19-220	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413S03**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	93	97	50-150	1	0-30	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Geomatrix Consultants, Inc.	Date Received:	N/A
250 East Rincon Street, Suite 204	Work Order No:	07-03-2015
Corona, CA 92879-1363	Preparation:	Cartridge
	Method:	EPA 314.0M

Project: AEROJET-AISA PERKIN ELMER AOC

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-05-205-245	**Solid**	**IC 6**	**04/11/07**	**04/11/07**	**070411L01**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	103	103	85-115	0	0-15	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Geomatrix Consultants, Inc.	Date Received:	N/A
250 East Rincon Street, Suite 204	Work Order No:	07-03-2015
Corona, CA 92879-1363	Preparation:	N/A
	Method:	EPA 314.0

Project: AEROJET-AISA PERKIN ELMER AOC

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-05-203-563	**Aqueous**	**IC 6**	**N/A**	**04/02/07**	**070402L01**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	96	95	85-115	1	0-15	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Geomatrix Consultants, Inc.	Date Received:	N/A
250 East Rincon Street, Suite 204	Work Order No:	07-03-2015
Corona, CA 92879-1363	Preparation:	Cartridge
	Method:	EPA 6850

Project: AEROJET-AISA PERKIN ELMER AOC

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-496-7	**Solid**	**LC/MS 1**	**03/30/07**	**04/06/07**	**070402L01**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	99	98	60-140	2	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Geomatrix Consultants, Inc.		Date Received:	N/A
250 East Rincon Street, Suite 204		Work Order No:	07-03-2015
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA PERKIN ELMER AOC

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-496-11	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L03**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	98	97	60-140	0	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 07-03-2015

Qualifier	Definition
*	See applicable analysis comment.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike or Matrix Spike Duplicate compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported with no further corrective action required.
A	Result is the average of all dilutions, as defined by the method.
B	Analyte was present in the associated method blank.
C	Analyte presence was not confirmed on primary column.
E	Concentration exceeds the calibration range.
H	Sample received and/or analyzed past the recommended holding time.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
N	Nontarget Analyte.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
U	Undetected at the laboratory method detection limit.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Don Burley

From: Richard Rees [RRees@geomatrix.com]
Sent: Tuesday, April 10, 2007 11:50 AM
To: Don Burley
Subject: RE: Aerojet AISA, Soil Samples

Don,

Please analyze the following samples collected and placed on hold for the Aerojet Azusa Project. Analyze all for perchlorate usir EPA Method 6850.

Samples collected March 30, 2007 under Geomatrix Chain-of-Custody COR 1111
PDZB-19-210
PDZB-29-220
PDZB-19-230
PDZB-19-240
PDZB-19-250

The sample PDZB-19-210 should also be analyzed using EPA Method 314 using the same preparation sample for both EPA Method 6850 and 314.

Thank you.

Rick Rees

G. Richard Rees, PG, CHG

Senior Hydrogeologist

Geomatrix Consultants, Inc.

250 East Rincon Street; Suite 204

Corona, California 92879

Tel: 951-273-7400, Fax: 951-273-7420, Cell: 951-757-0802, Pager: 714-663-5059

Email: rrees@geomatrix.com

CHAIN-OF-CUSTODY RECORD

2015 COR 11110

PROJECT NAME: AEROJET - AISA PERKIN ELMER AOC			DATE: 3/30/07 PAGE 1 OF 2
PROJECT NUMBER: 7190.005 1.7	LABORATORY NAME: CALSCIENCE	CLIENT INFORMATION: AEROJET-AISA	REPORTING REQUIREMENTS:
RESULTS TO: G. RICHARD REES	LABORATORY ADDRESS: 7440 LINCOLN WAY		
TURNAROUND TIME: STANDARD	GARDEN GROVE CA 92841		
SAMPLE SHIPMENT METHOD: COURIER	LABORATORY CONTACT: DON BURLY		GEOTRACKER REQUIRED YES (NO)
	LABORATORY PHONE NUMBER: 714-895-5494		SITE SPECIFIC GLOBAL ID NO.

SAMPLERS (SIGNATURE):

DATE	TIME	SAMPLE NUMBER	ANALYSES: EPA 314	ANALYSES: EPA 6850	CONTAINER TYPE AND SIZE	Soil (S), Water (W), Vapor (V), or Other (O)	Filtered	Preservative Type	Cooled	MS/MSD	No. of Containers	ADDITIONAL COMMENTS
3/29/07	16:48	EQB20070329	X		470ML PLASTIC B.	W			X		1	
3/30/07	10:48	PSZB-77-5		X	4 oz GLASS JAR	S			X		1	
3/30/07	10:50	PSZB-77-2.5		X	" " "	S			X		1	
3/30/07	10:51	PSZB-77-1		X	" " "	S			X		1	
3/30/07	11:43	PDZB-19-110		X	" " "	S			X		1	
3/30/07	12:40	PDZB-19-120		X	" " "	S			X		1	
3/30/07	12:56	PDZB-19-130		X	" " "	S			X		1	
3/30/07	13:09	PDZB-19-140		X	" " "	S			X		1	
3/30/07	13:24	PDZB-19-150		X	" " "	S			X		1	
3/30/07	13:37	PDZB-19-160		X	" " "	S			X		1	
3/30/07	13:56	PDZB-19-170		X	" " "	S			X		1	
3/30/07	14:08	PDZB-19-180		X	" " "	S			X		1	
3/30/07	14:26	PDZB-19-190		X	" " "	S			X		1	
3/30/07	14:35	PDZB-19-200		X	" " "	S			X		1	
3/30/07	14:53	PSZB-78-5		X	" " "	S			X		1	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
SIGNATURE:	3/30/07	14:27	SIGNATURE:	3/30/07	16:24
PRINTED NAME: KURT ZEIDER			PRINTED NAME: BACTA		
COMPANY: GEOMATRIX			COMPANY: CEC		
SIGNATURE:	3/30/07	17:27	SIGNATURE:		
PRINTED NAME: BACTA			PRINTED NAME: Shen Fana		
COMPANY: CEC			COMPANY: CEC	03:30:07	1727
SIGNATURE:			SIGNATURE:		
PRINTED NAME:			PRINTED NAME:		
COMPANY:			COMPANY:		

TOTAL NUMBER OF CONTAINERS: 15

SAMPLING COMMENTS:

250 East Rincon Street, Suite 204
Corona, California 92879-1363
Tel 951.273.7400 Fax 951.273.7420

Geomatrix

CHAIN-OF-CUSTODY RECORD

2015 COR 11111

PROJECT NAME: AEROJET-AISA PERKIN ELMER AOC			DATE: 3/30/07 PAGE 2 OF 2
PROJECT NUMBER: 7190.005 1.7	LABORATORY NAME: CALSCIENCE	CLIENT INFORMATION: AEROJET-AISA	REPORTING REQUIREMENTS:
RESULTS TO: G. RICHARD REES	LABORATORY ADDRESS: 7440 LINCOLN WAY GARDEN GROVE CA 92841		
TURNAROUND TIME: STANDARD	LABORATORY CONTACT: DON BURLY		GEOTRACKER REQUIRED YES (NO)
SAMPLE SHIPMENT METHOD: COURIER	LABORATORY PHONE NUMBER: 714-895-5494		SITE SPECIFIC GLOBAL ID NO.

SAMPLERS (SIGNATURE):

DATE	TIME	SAMPLE NUMBER	ANALYSES: EPA 6850	ANALYSES: HOLD	CONTAINER TYPE AND SIZE	Soil (S), Water (W), Vapor (V), or Other (O)	Filtered	Preservative Type	Cooled	MS/MSD	No. of Containers	ADDITIONAL COMMENTS
3/30/07	14:55	PSZB-78-2.5	X		40Z GLASS JAR	S			X		1	
3/30/07	14:57	PSZB-78-1	X		" " "	S			X		1	
3/30/07	14:59	PDZB-19-210	X	X	" " "	S			X		1	HOLD
3/30/07	15:08	PDZB-19-220	X	X	" " "	S			X		1	HOLD
3/30/07	15:26	PDZB-19-230	X	X	" " "	S			X		1	HOLD
3/30/07	15:40	PDZB-19-240	X	X	" " "	S			X		1	HOLD
3/30/07	15:57	PDZB-19-250	X	X	" " "	S			X		1	HOLD

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
SIGNATURE:	3/30/07	16:24	SIGNATURE:	3/30	1624
PRINTED NAME: CURT ZEILER			PRINTED NAME: BAC TA		
COMPANY: GEOMATRIX			COMPANY: CEL		
SIGNATURE:	3/30	1720	SIGNATURE:		
PRINTED NAME: BAC TA			PRINTED NAME: Shantama		
COMPANY: CEL			COMPANY: (CEL) 03.30.07 1727		
SIGNATURE:			SIGNATURE:		
PRINTED NAME:			PRINTED NAME:		
COMPANY:			COMPANY:		

TOTAL NUMBER OF CONTAINERS: 7

SAMPLING COMMENTS:

250 East Rincon Street, Suite 204
Corona, California 92879-1363
Tel 951.273.7400 Fax 951.273.7420

Geomatrix

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 07 - 03 - 2015

Cooler 1 of 1

SAMPLE RECEIPT FORM

CLIENT: Geomatrix DATE: 3/3/17

TEMPERATURE – SAMPLES RECEIVED BY:

CALSCIENCE COURIER:

_____ Chilled, cooler with temperature blank provided.
_____ Chilled, cooler without temperature blank.
✓ Chilled and placed in cooler with wet ice.
_____ Ambient and placed in cooler with wet ice.
_____ Ambient temperature.
4.0 °C Temperature blank.

LABORATORY (Other than Calscience Courier):

_____ °C Temperature blank.
_____ °C IR thermometer.
_____ Ambient temperature.

Initial:

CUSTODY SEAL INTACT:

Sample(s): _____ Cooler: _____ No (Not Intact) : _____ Not Present: ✓

Initial:

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody document(s) received with samples	✓		
Sampler's name indicated on COC	✓		
Sample container label(s) consistent with custody papers	✓		
Sample container(s) intact and good condition	✓		
Correct containers and volume for analyses requested	✓		
Proper preservation noted on sample label(s)			✓
VOA vial(s) free of headspace.			✓
Tedlar bag(s) free of condensation			✓

Initial:

COMMENTS:

Calscience
Environmental
Laboratories, Inc.

April 10, 2007

Rick Rees
Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Subject: **Calscience Work Order No.: 07-04-0038**
Client Reference: AEROJET-AISA / 7190.005

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 4/2/2007 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Don Burley
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.		Date Received:	04/02/07
250 East Rincon Street, Suite 204		Work Order No:	07-04-0038
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 314.0M

Project: AEROJET-AISA / 7190.005 — Page 1 of 1

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-83-2.5	**07-04-0038-2**	**04/02/07**	**Solid**	**IC 6**	**04/04/07**	**04/05/07**	**070405L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	1970	100	5		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-82-2.5	**07-04-0038-5**	**04/02/07**	**Solid**	**IC 6**	**04/04/07**	**04/05/07**	**070405L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	326	20.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-81-2.5	**07-04-0038-8**	**04/02/07**	**Solid**	**IC 6**	**04/04/07**	**04/05/07**	**070405L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	3750	200	10		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	**099-05-205-244**	**N/A**	**Solid**	**IC 6**	**04/04/07**	**04/05/07**	**070405L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	20.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Date Received: 04/02/07
Work Order No: 07-04-0038
Preparation: Cartridge
Method: EPA 6850

Project: AEROJET-AISA / 7190.005

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-83-1	**07-04-0038-1**	**04/02/07**	**Solid**	**LC/MS 1**	**04/04/07**	**04/10/07**	**070406L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	870	30	5		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-83-2.5	**07-04-0038-2**	**04/02/07**	**Solid**	**LC/MS 1**	**04/04/07**	**04/10/07**	**070406L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	2300	60	10		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-83-5	**07-04-0038-3**	**04/02/07**	**Solid**	**LC/MS 1**	**04/04/07**	**04/09/07**	**070406L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	320	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-82-1	**07-04-0038-4**	**04/02/07**	**Solid**	**LC/MS 1**	**04/04/07**	**04/09/07**	**070406L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	290	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-82-2.5	**07-04-0038-5**	**04/02/07**	**Solid**	**LC/MS 1**	**04/04/07**	**04/09/07**	**070406L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	340	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-82-5	**07-04-0038-6**	**04/02/07**	**Solid**	**LC/MS 1**	**04/04/07**	**04/09/07**	**070406L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	74	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Date Received: 04/02/07
Work Order No: 07-04-0038
Preparation: Cartridge
Method: EPA 6850

Project: AEROJET-AISA / 7190.005

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-81-1	**07-04-0038-7**	**04/02/07**	**Solid**	**LC/MS 1**	**04/04/07**	**04/10/07**	**070406L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	1700	60	10		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-81-2.5	**07-04-0038-8**	**04/02/07**	**Solid**	**LC/MS 1**	**04/04/07**	**04/10/07**	**070406L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	4100	60	10		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-81-5	**07-04-0038-9**	**04/02/07**	**Solid**	**LC/MS 1**	**04/04/07**	**04/09/07**	**070406L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	100	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	**099-12-496-9**	**N/A**	**Solid**	**LC/MS 1**	**04/04/07**	**04/09/07**	**070406L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Geomatrix Consultants, Inc. 250 East Rincon Street, Suite 204 Corona, CA 92879-1363	Date Received: Work Order No: Preparation: Method:	04/02/07 07-04-0038 Cartridge EPA 314.0M

Project AEROJET-AISA / 7190.005

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
PSZB-81-2.5	**Solid**	**IC 6**	**04/04/07**	**04/05/07**	**070405S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	124	124	80-120	0	0-15	3

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Geomatrix Consultants, Inc.	Date Received: 04/02/07
250 East Rincon Street, Suite 204	Work Order No: 07-04-0038
Corona, CA 92879-1363	Preparation: Cartridge
	Method: EPA 6850

Project AEROJET-AISA / 7190.005

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
PSZB-83-2.5	**Solid**	**LC/MS 1**	**04/04/07**	**04/09/07**	**070406S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	0	0	50-150	7	0-30	3

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Date Received: N/A
Work Order No: 07-04-0038
Preparation: Cartridge
Method: EPA 314.0M

Project: AEROJET-AISA / 7190.005

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-05-205-244	Solid	IC 6	04/04/07	04/05/07	070405L01

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	96	96	85-115	0	0-15	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Geomatrix Consultants, Inc.	Date Received: N/A
250 East Rincon Street, Suite 204	Work Order No: 07-04-0038
Corona, CA 92879-1363	Preparation: Cartridge
	Method: EPA 6850

Project: AEROJET-AISA / 7190.005

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-496-9	**Solid**	**LC/MS 1**	**04/04/07**	**04/09/07**	**070406L01**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	98	96	60-140	2	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 07-04-0038

Qualifier	Definition
*	See applicable analysis comment.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike or Matrix Spike Duplicate compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported with no further corrective action required.
A	Result is the average of all dilutions, as defined by the method.
B	Analyte was present in the associated method blank.
C	Analyte presence was not confirmed on primary column.
E	Concentration exceeds the calibration range.
H	Sample received and/or analyzed past the recommended holding time.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
N	Nontarget Analyte.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
U	Undetected at the laboratory method detection limit.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

CHAIN-OF-CUSTODY RECORD

0038 COR 11112

PROJECT NAME: AEROJET - ASA			DATE: 4.2.07 PAGE 1 OF 1
PROJECT NUMBER: 7190.005	LABORATORY NAME: CALSCIENCE	CLIENT INFORMATION: GEOMATRIX	REPORTING REQUIREMENTS:
RESULTS TO: Rick Rees	LABORATORY ADDRESS:		
TURNAROUND TIME: Normal			
SAMPLE SHIPMENT METHOD: Lab Courier	LABORATORY CONTACT: Dan Burney		GEOTRACKER REQUIRED YES (NO)
	LABORATORY PHONE NUMBER: 714-895-5494		SITE SPECIFIC GLOBAL ID NO.

SAMPLERS (SIGNATURE): Paul Jeffcs

	DATE	TIME	SAMPLE NUMBER	ANALYSES: EPA 6850	ANALYSES: EPA 314*	CONTAINER TYPE AND SIZE	Soil (S), Water (W), Vapor (V), or Other (O)	Filtered	Preservative Type	Cooled	MS/MSD	No. of Containers	ADDITIONAL COMMENTS
1	4-2-07	0850	PSZB-83-1	X		4oz Jar	S			X		1	
2	4.2.07	0900	PSZB-83-2.5	X	X	4 oz Jar	S			X		1	
3	4.2.07	0940	PSZB-83-5	X		4 oz Jar	S			X		1	
4	4.2.07	1030	PSZB-82-1	X		4 oz Jar	S			X		1	
5	4.2.07	1100	PSZB-82-2.5	X	X	4 oz Jar	S			X		1	
6	4.2.07	1140	PSZB-82-5	X		4 oz Jar	S			X		1	
7	4.2.07	1220	PSZB-81-1	X		4 oz Jar	S			X		1	
8	4.2.07	1245	PSZB-81-2.5	X	X	4 oz Jar	S			X		1	
9	4.2.07	1320	PSZB-81-5	X		4 oz Jar	S			X		1	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME	TOTAL NUMBER OF CONTAINERS: 9
SIGNATURE: Paul Jeffcs	4.2.07	1435	SIGNATURE:	4/2/7	1425	SAMPLING COMMENTS:
PRINTED NAME: PAUL JEFFCS			PRINTED NAME: BAC TA			*SAMPLES PSZB-81-2.5, PSZB-82-2.5 AND
COMPANY:			COMPANY: CEL			PSZB-83-2.5 ANALYZE FOR BOTH EPA 314
SIGNATURE:	4/2/7	1700	SIGNATURE:			AND EPA 6850 FROM SAME PREP SAMPLE
PRINTED NAME: BAC TA			PRINTED NAME: Shen Fama			
COMPANY: CEL			COMPANY: CEL 04.08.07 1700			
SIGNATURE:			SIGNATURE:			
PRINTED NAME:			PRINTED NAME:			
COMPANY:			COMPANY:			

250 East Rincon Street, Suite 204
Corona, California 92879-1363
Tel 951.273.7400 Fax 951.273.7420

Geomatrix

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 07 - 04 - 0038

Cooler 1 of 1

SAMPLE RECEIPT FORM

CLIENT: Geomatrix DATE: 4/27/07

TEMPERATURE – SAMPLES RECEIVED BY:

CALSCIENCE COURIER:

_____ Chilled, cooler with temperature blank provided.
_____ Chilled, cooler without temperature blank.
/ Chilled and placed in cooler with wet ice.
_____ Ambient and placed in cooler with wet ice.
_____ Ambient temperature.
3.6 °C Temperature blank.

LABORATORY (Other than Calscience Courier):

_____ °C Temperature blank.
_____ °C IR thermometer.
_____ Ambient temperature.

Initial:

CUSTODY SEAL INTACT:

Sample(s): _____ Cooler: _____ No (Not Intact) : _____ Not Present: ✓

Initial:

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody document(s) received with samples	✓		
Sampler's name indicated on COC	✓		
Sample container label(s) consistent with custody papers	✓		
Sample container(s) intact and good condition	✓		
Correct containers and volume for analyses requested	✓		
Proper preservation noted on sample label(s)			✓
VOA vial(s) free of headspace.			✓
Tedlar bag(s) free of condensation			✓

Initial:

COMMENTS:

Calscience
Environmental
Laboratories, Inc.

April 10, 2007

Rick Rees
Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Subject: **Calscience Work Order No.:** **07-04-0171**
Client Reference: **AEROJET-AISA / 7190.005**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 4/3/2007 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Don Burley
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.		Date Received:	04/03/07
250 East Rincon Street, Suite 204		Work Order No:	07-04-0171
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA / 7190.005

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
P1ZB-7-45	**07-04-0171-1**	**04/03/07**	**Solid**	**LC/MS 1**	**04/04/07**	**04/09/07**	**070406L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	25	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
P1ZB-7-50	**07-04-0171-2**	**04/03/07**	**Solid**	**LC/MS 1**	**04/04/07**	**04/09/07**	**070406L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	56	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
P1ZB-7-60	**07-04-0171-3**	**04/03/07**	**Solid**	**LC/MS 1**	**04/04/07**	**04/09/07**	**070406L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	47	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
P1ZB-7-70	**07-04-0171-4**	**04/03/07**	**Solid**	**LC/MS 1**	**04/04/07**	**04/09/07**	**070406L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	120	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
P1ZB-7-80	**07-04-0171-5**	**04/03/07**	**Solid**	**LC/MS 1**	**04/04/07**	**04/09/07**	**070406L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	57	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
P1ZB-7-90	**07-04-0171-6**	**04/03/07**	**Solid**	**LC/MS 1**	**04/04/07**	**04/09/07**	**070406L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	55	6.0	1		ug/kg

RL - Reporting Limit, DF - Dilution Factor, Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.		Date Received:	04/03/07
250 East Rincon Street, Suite 204		Work Order No:	07-04-0171
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA / 7190.005 Page 2 of 2

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
P1ZB-7-100	**07-04-0171-7**	**04/03/07**	**Solid**	**LC/MS 1**	**04/04/07**	**04/09/07**	**070406L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	79	6.0	1		ug/kg

Method Blank	**099-12-496-9**	**N/A**	**Solid**	**LC/MS 1**	**04/04/07**	**04/09/07**	**070406L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

RL - Reporting Limit, DF - Dilution Factor, Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Geomatrix Consultants, Inc.	Date Received: 04/03/07
250 East Rincon Street, Suite 204	Work Order No: 07-04-0171
Corona, CA 92879-1363	Preparation: Cartridge
	Method: EPA 6850

Project AEROJET-AISA / 7190.005

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
07-04-0038-2	**Solid**	**LC/MS 1**	**04/04/07**	**04/09/07**	**070406S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	0	0	50-150	7	0-30	3

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Geomatrix Consultants, Inc.		Date Received:	N/A
250 East Rincon Street, Suite 204		Work Order No:	07-04-0171
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA / 7190.005

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-496-9	**Solid**	**LC/MS 1**	**04/04/07**	**04/09/07**	**070406L01**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	98	96	60-140	2	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 07-04-0171

Qualifier	Definition
*	See applicable analysis comment.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike or Matrix Spike Duplicate compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported with no further corrective action required.
A	Result is the average of all dilutions, as defined by the method.
B	Analyte was present in the associated method blank.
C	Analyte presence was not confirmed on primary column.
E	Concentration exceeds the calibration range.
H	Sample received and/or analyzed past the recommended holding time.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
N	Nontarget Analyte.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
U	Undetected at the laboratory method detection limit.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

CHAIN-OF-CUSTODY RECORD

(0171) COR 11113

PROJECT NAME: AEROJET - AISA			DATE: 4-3-07 PAGE 1 OF 1
PROJECT NUMBER: 7190.005	LABORATORY NAME: CALSCIENCE	CLIENT INFORMATION: GEOMATRIX	REPORTING REQUIREMENTS:
RESULTS TO: Rick REES	LABORATORY ADDRESS:		
TURNAROUND TIME: Normal			
SAMPLE SHIPMENT METHOD: LAB Courier	LABORATORY CONTACT: Doug Bunny		GEOTRACKER REQUIRED YES (NO)
	LABORATORY PHONE NUMBER: 714-895-5494		SITE SPECIFIC GLOBAL ID NO.

SAMPLERS (SIGNATURE): PJJ

	DATE	TIME	SAMPLE NUMBER	ANALYSES: EPA 6850	CONTAINER TYPE AND SIZE	Soil (S), Water (W), Vapor (V), or Other (O)	Filtered	Preservative Type	Cooled	MS/MSD	No. of Containers	ADDITIONAL COMMENTS
1	4.3.07	1128	P12B-7-45	X	4 oz Jar	S			X		1	
2	4.3.07	1144	P12B-7-50	X	4 oz Jar	S			X		1	
3	4.3.07	1158	P12B-7-60	X	4 oz Jar	S			X		1	
4	4.3.07	1216	P12B-7-70	X	4 oz Jar	S			X		1	
5	4.3.07	1234	P12B-7-80	X	4 oz Jar	S			X		1	
6	4.3.07	1253	P12B-7-90	X	4 oz Jar	S			X		1	
7	4.3.07	1305	P12B-7-100	X	4 oz Jar	S			X		1	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME	TOTAL NUMBER OF CONTAINERS: 7
SIGNATURE: PJJ	4.3.07	1420	SIGNATURE: Alex Marquez	4/3/7	14:20	SAMPLING COMMENTS:
PRINTED NAME: PAUL JEFFERS			PRINTED NAME: ALEX MARQUEZ			
COMPANY:			COMPANY:			
SIGNATURE: Alex Marquez	4/3/7	17:00	SIGNATURE:	4/3/07	1700	
PRINTED NAME: ALEX MARQUEZ			PRINTED NAME:			
COMPANY:			COMPANY:			
SIGNATURE:			SIGNATURE:			
PRINTED NAME:			PRINTED NAME:			
COMPANY:			COMPANY:			

250 East Rincon Street, Suite 204
Corona, California 92879-1363
Tel 951.273.7400 Fax 951.273.7420

Geomatrix

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 07 - 04 - 0171

Cooler 1 of 1

SAMPLE RECEIPT FORM

CLIENT: GEOMATRIX DATE: 4/3/07

TEMPERATURE – SAMPLES RECEIVED BY:

CALSCIENCE COURIER:

_____ Chilled, cooler with temperature blank provided.
_____ Chilled, cooler without temperature blank.
✓ Chilled and placed in cooler with wet ice.
_____ Ambient and placed in cooler with wet ice.
_____ Ambient temperature.

3-8 °C Temperature blank.

LABORATORY (Other than Calscience Courier):

_____ °C Temperature blank.
_____ °C IR thermometer.
_____ Ambient temperature.

Initial: A.M.

CUSTODY SEAL INTACT:

Sample(s): _____ Cooler: _____ No (Not Intact) : _____ Not Present: ✓

Initial: A.M.

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody document(s) received with samples	✓		
Sampler's name indicated on COC	✓		
Sample container label(s) consistent with custody papers	✓		
Sample container(s) intact and good condition	✓		
Correct containers and volume for analyses requested	✓		
Proper preservation noted on sample label(s)			✓
VOA vial(s) free of headspace			✓
Tedlar bag(s) free of condensation			✓

Initial: A.M.

COMMENTS:

Calscience
Environmental
Laboratories, Inc.

Supplemental Report 1

May 23, 2007

The original report has been revised/corrected.

Rick Rees
Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Subject: **Calscience Work Order No.:** **07-04-0615**
Client Reference: **AEROJET-AISA / 7190.005**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 4/9/2007 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Don Burley
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.	Date Received: 04/09/07
250 East Rincon Street, Suite 204	Work Order No: 07-04-0615
Corona, CA 92879-1363	Preparation: N/A
	Method: EPA 314.0

Project: AEROJET-AISA / 7190.005

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
20070409-EB	**07-04-0615-1**	**04/09/07**	**Aqueous**	**IC 8**	**N/A**	**04/14/07**	**070414L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	3.0	1		ug/L

Method Blank	099-05-203-572	N/A	Aqueous	IC 8	N/A	04/14/07	070414L01

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	3.0	1		ug/L

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

ndc

Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Date Received: 04/09/07
Work Order No: 07-04-0615
Preparation: Cartridge
Method: EPA 6850

Project: AEROJET-AISA / 7190.005

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-81-7.5	**07-04-0615-2**	**04/09/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	140	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-81-10	**07-04-0615-3**	**04/09/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	44	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-81-15	**07-04-0615-4**	**04/09/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	58	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-81-20	**07-04-0615-5**	**04/09/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	24	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-81-25	**07-04-0615-6**	**04/09/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	11	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-81-30	**07-04-0615-7**	**04/09/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	19	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.	Date Received: 04/09/07
250 East Rincon Street, Suite 204	Work Order No: 07-04-0615
Corona, CA 92879-1363	Preparation: Cartridge
	Method: EPA 6850

Project: AEROJET-AISA / 7190.005

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-81-35	**07-04-0615-8**	**04/09/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	17	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-81-40	**07-04-0615-9**	**04/09/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	18	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-82-7.5	**07-04-0615-10**	**04/09/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	90	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-82-10	**07-04-0615-11**	**04/09/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	110	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-82-15	**07-04-0615-12**	**04/09/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	17	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-82-20	**07-04-0615-13**	**04/09/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	25	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.		Date Received:	04/09/07
250 East Rincon Street, Suite 204		Work Order No:	07-04-0615
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA / 7190.005

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-82-25	**07-04-0615-14**	**04/09/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	8.4	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-82-30	**07-04-0615-15**	**04/09/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	12	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-82-35	**07-04-0615-16**	**04/09/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	20	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-82-40	**07-04-0615-17**	**04/09/07**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	20	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	**099-12-496-10**	**N/A**	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Date Received: 04/09/07
Work Order No: 07-04-0615
Preparation: N/A
Method: EPA 314.0

Project AEROJET-AISA / 7190.005

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
20070409-EB	**Aqueous**	**IC 8**	**N/A**	**04/14/07**	**070414S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	85	95	80-120	12	0-15	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Geomatrix Consultants, Inc.	Date Received:	04/09/07
250 East Rincon Street, Suite 204	Work Order No:	07-04-0615
Corona, CA 92879-1363	Preparation:	Cartridge
	Method:	EPA 6850

Project AERojET-AISA / 7190.005

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
PSZB-81-40	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	83	83	50-150	0	0-30	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Geomatrix Consultants, Inc.		Date Received:	N/A
250 East Rincon Street, Suite 204		Work Order No:	07-04-0615
Corona, CA 92879-1363		Preparation:	N/A
		Method:	EPA 314.0

Project: AEROJET-AISA / 7190.005

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-05-203-572	**Aqueous**	**IC 8**	**N/A**	**04/14/07**	**070414L01**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	90	90	85-115	0	0-15	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Geomatrix Consultants, Inc.		Date Received:	N/A
250 East Rincon Street, Suite 204		Work Order No:	07-04-0615
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA / 7190.005

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-496-10	**Solid**	**LC/MS 1**	**04/10/07**	**04/16/07**	**070413L01**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	96	95	60-140	1	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 07-04-0615

Qualifier	Definition
*	See applicable analysis comment.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike or Matrix Spike Duplicate compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported with no further corrective action required.
A	Result is the average of all dilutions, as defined by the method.
B	Analyte was present in the associated method blank.
C	Analyte presence was not confirmed on primary column.
E	Concentration exceeds the calibration range.
H	Sample received and/or analyzed past the recommended holding time.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
N	Nontarget Analyte.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
U	Undetected at the laboratory method detection limit.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

CHAIN-OF-CUSTODY RECORD

(0615) COR 11114

PROJECT NAME: AISA

DATE: 9 April 2007 | PAGE 1 OF 2

PROJECT NUMBER: 7190.005	LABORATORY NAME: Calscience	CLIENT INFORMATION:	REPORTING REQUIREMENTS:
RESULTS TO: Rick Rees	LABORATORY ADDRESS: 7440 Lincoln Way, Garden Grove, CA		
TURNAROUND TIME: Standard	LABORATORY CONTACT: Don Bucky		GEOTRACKER REQUIRED YES NO
SAMPLE SHIPMENT METHOD: Courier	LABORATORY PHONE NUMBER: 714-895-5494		SITE SPECIFIC GLOBAL ID NO.

SAMPLERS (SIGNATURE):

ANALYSES

	DATE	TIME	SAMPLE NUMBER	EPA 6850	EPA 314	CONTAINER TYPE AND SIZE	Soil (S), Water (W), Vapor (V), or Other (O)	Filtered	Preservative Type	Cooled	MS/MSD	No. of Containers	ADDITIONAL COMMENTS
1	04-09-07	1203	20070409-EB		X	500-ml Poly	W			X		1	
2		1223	PSZB-B1-7.5	X		4-oz glass jar	S			X		1	
3		1226	PSZB-B1-10	X									
4		1236	PSZB-B1-15	X									
5		1239	PSZB-B1-20	X									
6		1249	PSZB-B1-25	X									
7		1252	PSZB-B1-30	X									
8		1306	PSZB-B1-35	X									
9		1309	PSZB-B1-40	X									
10		1533	PSZB-B2-7.5	X									Sample Time is 1533
11		1536	PSZB-B2-10	X									
12		1546	PSZB-B2-15	X									
13		1551	PSZB-B2-20	X									
14		1557	PSZB-B2-25	X									
15	04-09-07	1602	PSZB-B2-30	X		4oz glass jar	S			X		1	

TOTAL NUMBER OF CONTAINERS: 15

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
SIGNATURE:	04-09-07	1620	SIGNATURE:	4/9/7	16:20
PRINTED NAME: Eric Bucky			PRINTED NAME: Mary Manager		
COMPANY: Geomatrix			COMPANY: CE-		
SIGNATURE:	4/9/7	17:30	SIGNATURE:		
PRINTED NAME: Mary Manager			PRINTED NAME: Shen Fama		
COMPANY: CE-			COMPANY: (CE)	04-09-07	1730
SIGNATURE:			SIGNATURE:		
PRINTED NAME:			PRINTED NAME:		
COMPANY:			COMPANY:		

SAMPLING COMMENTS:

250 East Rincon Street, Suite 204
Corona, California 92879-1363
Tel 951.273.7400 Fax 951.273.7420

Geomatrix

CHAIN-OF-CUSTODY RECORD

(0615) COR 11115

PROJECT NAME: AISA			DATE: 9 April 07 PAGE 2 OF 2
PROJECT NUMBER: 7190.005	LABORATORY NAME: Calscience	CLIENT INFORMATION:	REPORTING REQUIREMENTS:
RESULTS TO: Rick Rees	LABORATORY ADDRESS: 7440 Lincoln Way Garden Grove, CA		
TURNAROUND TIME: Standard			
SAMPLE SHIPMENT METHOD: Courier	LABORATORY CONTACT: Don Bueky		GEOTRACKER REQUIRED YES NO
	LABORATORY PHONE NUMBER: 714-895-5494		SITE SPECIFIC GLOBAL ID NO.

SAMPLERS (SIGNATURE):

	DATE	TIME	SAMPLE NUMBER	ANALYSES: EPA 6850	CONTAINER TYPE AND SIZE	Soil (S), Water (W), Vapor (V), or Other (O)	Filtered	Preservative Type	Cooled	MS/MSD	No. of Containers	ADDITIONAL COMMENTS
SF												
16	04-09-07	1609	PSZB-82-35	X	4-oz glass jar	S			X		1	
17	04-09-07	1615	PSZB-82-40	X	4-oz glass jar	S			X		1	
SF												

04-09-07

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
SIGNATURE:	04-09-07	1620	SIGNATURE:	4/9/7	16:20
PRINTED NAME: Lucas Buckey			PRINTED NAME: ALEX MARQUEZ		
COMPANY: Geomatrix			COMPANY: CEL		
SIGNATURE:	4/9/7	17:30	SIGNATURE:		
PRINTED NAME: ALEX MARQUEZ			PRINTED NAME: Shen Fama		
COMPANY: CEL			COMPANY: CEL 04.09.07	1730	
SIGNATURE:			SIGNATURE:		
PRINTED NAME:			PRINTED NAME:		
COMPANY:			COMPANY:		

TOTAL NUMBER OF CONTAINERS: 2

SAMPLING COMMENTS:

250 East Rincon Street, Suite 204
Corona, California 92879-1363
Tel 951.273.7400 Fax 951.273.7420

Geomatrix

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 07 - 04 - 0615

Cooler 1 of 1

SAMPLE RECEIPT FORM

CLIENT: GEOMATRIX DATE: 4/9/07

TEMPERATURE – SAMPLES RECEIVED BY:

CALSCIENCE COURIER:

- _____ Chilled, cooler with temperature blank provided.
- ✓ Chilled, cooler without temperature blank.
- _____ Chilled and placed in cooler with wet ice.
- _____ Ambient and placed in cooler with wet ice.
- _____ Ambient temperature.

3.8 °C Temperature blank.

LABORATORY (Other than Calscience Courier):

- _____ °C Temperature blank.
- _____ °C IR thermometer.
- _____ Ambient temperature.

Initial: AM

CUSTODY SEAL INTACT:

Sample(s): _____ Cooler: _____ No (Not Intact) : _____ Not Present: ✓

Initial: AM

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody document(s) received with samples	✓		
Sampler's name indicated on COC	✓		
Sample container label(s) consistent with custody papers	✓		
Sample container(s) intact and good condition	✓		
Correct containers and volume for analyses requested	✓		
Proper preservation noted on sample label(s)			✓
VOA vial(s) free of headspace.			✓
Tedlar bag(s) free of condensation			✓

Initial: AM

COMMENTS:

Calscience
Environmental
Laboratories, Inc.

April 17, 2007

Rick Rees
Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Subject: **Calscience Work Order No.: 07-04-0696**
Client Reference: AEROJET-AISA / 7190.005

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 4/10/2007 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Don Burley
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.		Date Received:	04/10/07
250 East Rincon Street, Suite 204		Work Order No:	07-04-0696
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA / 7190.005

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-83-7.5	**07-04-0696-1**	**04/10/07**	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	270	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-83-10	**07-04-0696-2**	**04/10/07**	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	71	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-83-15	**07-04-0696-3**	**04/10/07**	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	19	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-83-20	**07-04-0696-4**	**04/10/07**	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	13	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-83-25	**07-04-0696-5**	**04/10/07**	**Solid**	**LC/MS 1**	**04/11/07**	**04/17/07**	**070413L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	16	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-83-30	**07-04-0696-6**	**04/10/07**	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	16	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.		Date Received:	04/10/07
250 East Rincon Street, Suite 204		Work Order No:	07-04-0696
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA / 7190.005

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-83-35	**07-04-0696-7**	**04/10/07**	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	14	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-83-40	**07-04-0696-8**	**04/10/07**	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	7.1	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-84-1	**07-04-0696-9**	**04/10/07**	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	66	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-84-2.5	**07-04-0696-10**	**04/10/07**	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	140	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-84-5	**07-04-0696-11**	**04/10/07**	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	520	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-84-7.5	**07-04-0696-12**	**04/10/07**	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	13	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Date Received: 04/10/07
Work Order No: 07-04-0696
Preparation: Cartridge
Method: EPA 6850

Project: AEROJET-AISA / 7190.005

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-84-10	**07-04-0696-13**	**04/10/07**	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	18	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-84-15	**07-04-0696-14**	**04/10/07**	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	68	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-84-20	**07-04-0696-15**	**04/10/07**	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	62	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-84-25	**07-04-0696-16**	**04/10/07**	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	70	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-84-30	**07-04-0696-17**	**04/10/07**	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	62	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-84-35	**07-04-0696-18**	**04/10/07**	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	270	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.	Date Received: 04/10/07
250 East Rincon Street, Suite 204	Work Order No: 07-04-0696
Corona, CA 92879-1363	Preparation: Cartridge
	Method: EPA 6850

Project: AEROJET-AISA / 7190.005 Page 4 of 4

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-84-40	**07-04-0696-19**	**04/10/07**	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	250	6.0	1		ug/kg

Method Blank	099-12-496-12	N/A	Solid	LC/MS 1	04/11/07	04/16/07	070413L02

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Date Received: 04/10/07
Work Order No: 07-04-0696
Preparation: Cartridge
Method: EPA 6850

Project AEROJET-AISA / 7190.005

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
PSZB-83-35	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413S02**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	74	74	50-150	0	0-30	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Geomatrix Consultants, Inc.	Date Received:	N/A
250 East Rincon Street, Suite 204	Work Order No:	07-04-0696
Corona, CA 92879-1363	Preparation:	Cartridge
	Method:	EPA 6850

Project: AEROJET-AISA / 7190.005

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-496-12	**Solid**	**LC/MS 1**	**04/11/07**	**04/16/07**	**070413L02**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	95	93	60-140	1	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 07-04-0696

Qualifier	Definition
*	See applicable analysis comment.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike or Matrix Spike Duplicate compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported with no further corrective action required.
A	Result is the average of all dilutions, as defined by the method.
B	Analyte was present in the associated method blank.
C	Analyte presence was not confirmed on primary column.
E	Concentration exceeds the calibration range.
H	Sample received and/or analyzed past the recommended holding time.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
N	Nontarget Analyte.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
U	Undetected at the laboratory method detection limit.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

Page 2 is COC cont.

CHAIN-OF-CUSTODY RECORD

(06966) COR 11116

PROJECT NAME: AISA

DATE: 10 April 2007 PAGE 1 OF 2

PROJECT NUMBER: 7190.005

LABORATORY NAME: Calscience

CLIENT INFORMATION:

REPORTING REQUIREMENTS:

RESULTS TO: Rick Rees

LABORATORY ADDRESS:

TURNAROUND TIME: Standard

SAMPLE SHIPMENT METHOD: Courier

LABORATORY CONTACT: Don Burley

LABORATORY PHONE NUMBER: 714-895-5494

GEOTRACKER REQUIRED YES NO

SITE SPECIFIC GLOBAL ID NO.

SAMPLERS (SIGNATURE): [signature]

ANALYSES: EPA 6850

	DATE	TIME	SAMPLE NUMBER	EPA 6850	CONTAINER TYPE AND SIZE	Soil (S), Water (W), Vapor (V), or Other (O)	Filtered	Preservative Type	Cooled	MS/MSD	No. of Containers	ADDITIONAL COMMENTS
1	04-10-07	0740	PSZB-83-7.5	X	4-oz glass jar	S			X		1	
2	04-10-07	0746	PSZB-83-10	X	4-oz glass jar	S			X		1	
3	04-10-07	0802	PSZB-83-15	X	4-oz glass jar	S			X		1	
4	04-10-07	0806	PSZB-83-20	X	4-oz glass jar	S			X		1	
5	04-10-07	0816	PSZB-83-25	X	4-oz glass jar	S			X		1	
6	04-10-07	0823	PSZB-83-30	X	4-oz glass jar	S			X		1	
7	04-10-07	0830	PSZB-83-35	X	4-oz glass jar	S			X		1	
8	04-10-07	0833	PSZB-83-40	X	4-oz glass jar	S			X		1	
9	04-10-07	1125	PSZB-84-1	X	4-oz glass jar	S			X		1	
10	04-10-07	1127	PSZB-84-2.5	X	4-oz glass jar	S			X		1	
11	04-10-07	1136	PSZB-84-~~7.5~~ 5	X	4-oz glass jar	S			X		1	
12	04-10-07	1138	PSZB-84-7.5	X	4-oz glass jar	S			X		1	
13	04-10-07	1140	PSZB-84-10	X	4-oz glass jar	S			X		1	
14	04-10-07	1149	PSZB-84-15	X	4-oz glass jar	S			X		1	
15	04-10-07	1150	PSZB-84-20	X	4-oz glass jar	S			X		1	

TOTAL NUMBER OF CONTAINERS: 15

SAMPLING COMMENTS:

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
SIGNATURE: [signature] PRINTED NAME: Lucas Burley COMPANY: Geomatrix	041007	1652	SIGNATURE: [signature] PRINTED NAME: Alex Marquez COMPANY: CEL	4/10/7	16:52
SIGNATURE: [signature] PRINTED NAME: Alex Marquez COMPANY: CEL	4/10/7	18:00	SIGNATURE: [signature] PRINTED NAME: Sheri Fama COMPANY: (CEL)	04.10.07	1800
SIGNATURE: PRINTED NAME: COMPANY:			SIGNATURE: PRINTED NAME: COMPANY:		

250 East Rincon Street, Suite 204
Corona, California 92879-1363
Tel 951.273.7400 Fax 951.273.7420

Geomatrix

CHAIN-OF-CUSTODY RECORD

(06916) COR 11117

PROJECT NAME: AIsA | DATE: 10 April 2007 | PAGE 2 OF 2

PROJECT NUMBER: 7190.005 | LABORATORY NAME: CalScience | CLIENT INFORMATION: | REPORTING REQUIREMENTS:

RESULTS TO: Rick Rees | LABORATORY ADDRESS:

TURNAROUND TIME: Normal

SAMPLE SHIPMENT METHOD: Courier | LABORATORY CONTACT: Dan Brady | GEOTRACKER REQUIRED YES NO

LABORATORY PHONE NUMBER: 714-895-5494 | SITE SPECIFIC GLOBAL ID NO.

SAMPLERS (SIGNATURE):

	DATE	TIME	SAMPLE NUMBER	ANALYSES: EPA 6850	CONTAINER TYPE AND SIZE	Soil (S), Water (W), Vapor (V), or Other (O)	Filtered	Preservative Type	Cooled	MS/MSD	No. of Containers	ADDITIONAL COMMENTS
16	04-10-07	1159	PSZB-B4-25	X	4-oz glass jar	S			X		1	
17	04-10-07	1203	PSZB-B4-30	X	4-oz glass jar	S			X		1	
18	04-10-07	1220	PSZB-B4-35	X	4-oz glass jar	S			X		1	
19	04-10-07	1222	PSZB-B4-40	X	4-oz glass jar	S			X		1	
									4°C			

04-10-07

TOTAL NUMBER OF CONTAINERS: 4

SAMPLING COMMENTS:

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
SIGNATURE:	04-10-07	1657	SIGNATURE:	4/10/7	16:52
PRINTED NAME: Lucas E. Bueby			PRINTED NAME: Alex Marquez		
COMPANY: Geomatrix			COMPANY: CEL		
SIGNATURE:	4/10/7	18:00	SIGNATURE:		
PRINTED NAME: Alex Marquez			PRINTED NAME: Stan Fama		
COMPANY: CEL			COMPANY: (CEL) 04.10.07	1800	
SIGNATURE:			SIGNATURE:		
PRINTED NAME:			PRINTED NAME:		
COMPANY:			COMPANY:		

250 East Rincon Street, Suite 204
Corona, California 92879-1363
Tel 951.273.7400 Fax 951.273.7420

Geomatrix

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 07 - 04 - 0696

Cooler 1 of 1

SAMPLE RECEIPT FORM

CLIENT: GEOMATRIX DATE: 4/10/07

TEMPERATURE – SAMPLES RECEIVED BY:

CALSCIENCE COURIER:

_____ Chilled, cooler with temperature blank provided.
✓ Chilled, cooler without temperature blank.
_____ Chilled and placed in cooler with wet ice.
_____ Ambient and placed in cooler with wet ice.
_____ Ambient temperature.
3.8 °C Temperature blank.

LABORATORY (Other than Calscience Courier):

_____ °C Temperature blank.
_____ °C IR thermometer.
_____ Ambient temperature.

Initial: AM.

CUSTODY SEAL INTACT:

Sample(s): _____ Cooler: _____ No (Not Intact) : _____ Not Present: ✓

Initial: AM.

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody document(s) received with samples	✓		
Sampler's name indicated on COC	✓		
Sample container label(s) consistent with custody papers	✓		
Sample container(s) intact and good condition	✓		
Correct containers and volume for analyses requested	✓		
Proper preservation noted on sample label(s)			✓
VOA vial(s) free of headspace.			✓
Tedlar bag(s) free of condensation			✓

Initial: AM

COMMENTS:

Calscience
Environmental
Laboratories, Inc.

April 18, 2007

Rick Rees
Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Subject: **Calscience Work Order No.:** **07-04-0807**
Client Reference: **AEROJET-AISA / 7190.005**

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 4/11/2007 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Don Burley
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.		Date Received:	04/11/07
250 East Rincon Street, Suite 204		Work Order No:	07-04-0807
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA / 7190.005

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-74-7.5	**07-04-0807-1**	**04/11/07**	**Solid**	**LC/MS 1**	**04/12/07**	**04/18/07**	**070417L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	32	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-74-10	**07-04-0807-2**	**04/11/07**	**Solid**	**LC/MS 1**	**04/12/07**	**04/18/07**	**070417L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	30	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-74-15	**07-04-0807-3**	**04/11/07**	**Solid**	**LC/MS 1**	**04/12/07**	**04/18/07**	**070417L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	8.9	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-74-20	**07-04-0807-4**	**04/11/07**	**Solid**	**LC/MS 1**	**04/12/07**	**04/18/07**	**070417L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	12	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-74-25	**07-04-0807-5**	**04/11/07**	**Solid**	**LC/MS 1**	**04/12/07**	**04/18/07**	**070417L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-74-30	**07-04-0807-6**	**04/11/07**	**Solid**	**LC/MS 1**	**04/12/07**	**04/18/07**	**070417L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.		Date Received:	04/11/07
250 East Rincon Street, Suite 204		Work Order No:	07-04-0807
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA / 7190.005

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-74-35	**07-04-0807-7**	**04/11/07**	**Solid**	**LC/MS 1**	**04/12/07**	**04/18/07**	**070417L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-74-40	**07-04-0807-8**	**04/11/07**	**Solid**	**LC/MS 1**	**04/12/07**	**04/18/07**	**070417L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-75-7.5	**07-04-0807-9**	**04/11/07**	**Solid**	**LC/MS 1**	**04/12/07**	**04/18/07**	**070417L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	54	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-75-10	**07-04-0807-10**	**04/11/07**	**Solid**	**LC/MS 1**	**04/12/07**	**04/18/07**	**070417L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	13	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-75-15	**07-04-0807-11**	**04/11/07**	**Solid**	**LC/MS 1**	**04/12/07**	**04/18/07**	**070417L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	8.4	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-75-20	**07-04-0807-12**	**04/11/07**	**Solid**	**LC/MS 1**	**04/12/07**	**04/18/07**	**070417L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	11	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.		Date Received:	04/11/07
250 East Rincon Street, Suite 204		Work Order No:	07-04-0807
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA / 7190.005

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-75-25	**07-04-0807-13**	**04/11/07**	**Solid**	**LC/MS 1**	**04/12/07**	**04/18/07**	**070417L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	16	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-75-30	**07-04-0807-14**	**04/11/07**	**Solid**	**LC/MS 1**	**04/12/07**	**04/18/07**	**070417L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	12	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-75-35	**07-04-0807-15**	**04/11/07**	**Solid**	**LC/MS 1**	**04/12/07**	**04/18/07**	**070417L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	6.6	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-75-40	**07-04-0807-16**	**04/11/07**	**Solid**	**LC/MS 1**	**04/12/07**	**04/18/07**	**070417L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	11	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	**099-12-496-14**	**N/A**	**Solid**	**LC/MS 1**	**04/12/07**	**04/18/07**	**070417L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Geomatrix Consultants, Inc.	Date Received: 04/11/07
250 East Rincon Street, Suite 204	Work Order No: 07-04-0807
Corona, CA 92879-1363	Preparation: Cartridge
	Method: EPA 6850

Project AEROJET-AISA / 7190.005

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
PSZB-74-7.5	**Solid**	**LC/MS 1**	**04/12/07**	**04/18/07**	**070417S02**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	88	85	50-150	3	0-30	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Geomatrix Consultants, Inc.		Date Received:	N/A
250 East Rincon Street, Suite 204		Work Order No:	07-04-0807
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA / 7190.005

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-496-14	**Solid**	**LC/MS 1**	**04/12/07**	**04/18/07**	**070417L02**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	101	103	60-140	2	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 07-04-0807

Qualifier	Definition
*	See applicable analysis comment.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike or Matrix Spike Duplicate compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported with no further corrective action required.
A	Result is the average of all dilutions, as defined by the method.
B	Analyte was present in the associated method blank.
C	Analyte presence was not confirmed on primary column.
E	Concentration exceeds the calibration range.
H	Sample received and/or analyzed past the recommended holding time.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
N	Nontarget Analyte.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
U	Undetected at the laboratory method detection limit.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

CHAIN-OF-CUSTODY RECORD

0807 COR 11118

PROJECT NAME: AISA

DATE: 11 APR 2007 PAGE 1 OF 2

PROJECT NUMBER: 7190.005

RESULTS TO: Rick Rees

TURNAROUND TIME: Standard

SAMPLE SHIPMENT METHOD: Courier

LABORATORY NAME: Calscience

LABORATORY ADDRESS:

LABORATORY CONTACT: Don Bunly

LABORATORY PHONE NUMBER: 714-895-5494

CLIENT INFORMATION:

REPORTING REQUIREMENTS:

GEOTRACKER REQUIRED YES NO

SITE SPECIFIC GLOBAL ID NO.

SAMPLERS (SIGNATURE):

ANALYSES

	DATE	TIME	SAMPLE NUMBER	EPA 8050	CONTAINER TYPE AND SIZE	Soil (S), Water (W), Vapor (V), or Other (O)	Filtered	Preservative Type	Cooled	MS/MSD	No. of Containers	ADDITIONAL COMMENTS
1	4-11-07	0830	PSZB-74-7.5	X	4-oz glass jar	S			X		1	
2		0832	PSZB-74-10	X								
3		0838	PSZB-74-15	X								
4		0842	PSZB-74-20	X								
5		0851	PSZB-74-25	X								
6		0856	PSZB-74-30	X								
7		0908	PSZB-74-35	X								
8		0911	PSZB-74-40	X								
9		1138	PSZB-75-7.5	X								
10		1140	PSZB-75-10	X								
11		1151	PSZB-75-15	X								
12		1155	PSZB-75-20	X								
13		1201	PSZB-75-25	X								
14		1204	PSZB-75-30	X								
15	04-11-07	1211	PSZB-75-35	X	4-oz glass jar	S			X		1	

TOTAL NUMBER OF CONTAINERS: 15

SAMPLING COMMENTS:

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
SIGNATURE:	04-11-07	16:00	SIGNATURE:	4/11/7	16:00
PRINTED NAME: Lucas Bunly			PRINTED NAME: ALEX MARQUEZ		
COMPANY: Geomatrix			COMPANY: CEL		
SIGNATURE:	4/11/7	17:46	SIGNATURE:		1740
PRINTED NAME: ALEX MARQUEZ			PRINTED NAME:		
COMPANY: CEL			COMPANY: (CEL) 04.11.07		
SIGNATURE:			SIGNATURE:		
PRINTED NAME:			PRINTED NAME:		
COMPANY:			COMPANY:		

250 East Rincon Street, Suite 204
Corona, California 92879-1363
Tel 951.273.7400 Fax 951.273.7420

Geomatrix

CHAIN-OF-CUSTODY RECORD

0807 COR 11119

PROJECT NAME: AISA			DATE: 11 April 2007 PAGE 2 OF 2
PROJECT NUMBER: 7190.005	LABORATORY NAME: Lockheed	CLIENT INFORMATION:	REPORTING REQUIREMENTS:
RESULTS TO: Rick Rees	LABORATORY ADDRESS:		
TURNAROUND TIME: Standard			
SAMPLE SHIPMENT METHOD: Courier	LABORATORY CONTACT: Don Buckley		GEOTRACKER REQUIRED YES NO
	LABORATORY PHONE NUMBER: 714-895-5494		SITE SPECIFIC GLOBAL ID NO.

SAMPLERS (SIGNATURE):

DATE	TIME	SAMPLE NUMBER	ANALYSES: EPA 8500	CONTAINER TYPE AND SIZE	Soil (S), Water (W), Vapor (V), or Other (O)	Filtered	Preservative Type	Cooled	MS/MSD	No. of Containers	ADDITIONAL COMMENTS
1604-11-07	1213	PSZB-75-40	X	4-oz glass jar	S			X		1	

04-11-07

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
SIGNATURE:	04-11-07	16:00	SIGNATURE:	4/11/7	16:00
PRINTED NAME: Lucas E. Buckley			PRINTED NAME: ALEX MARQUEZ		
COMPANY: Geomatrix			COMPANY: CEL		
SIGNATURE:	4/11/7	17:40	SIGNATURE:		1740
PRINTED NAME: ALEX MARQUEZ			PRINTED NAME: Sheri Fama		
COMPANY: CEL			COMPANY: (GX) 04.11.07		
SIGNATURE:			SIGNATURE:		
PRINTED NAME:			PRINTED NAME:		
COMPANY:			COMPANY:		

TOTAL NUMBER OF CONTAINERS: 1

SAMPLING COMMENTS:

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Corona, California 92879-1363
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Geomatrix

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 07 - 04 - 0807

Cooler 1 of 1

SAMPLE RECEIPT FORM

CLIENT: GEOMATRIX **DATE:** 4/6/7

TEMPERATURE – SAMPLES RECEIVED BY:

CALSCIENCE COURIER:

- _____ Chilled, cooler with temperature blank provided.
- ✓ Chilled, cooler without temperature blank.
- _____ Chilled and placed in cooler with wet ice.
- _____ Ambient and placed in cooler with wet ice.
- _____ Ambient temperature.

3.8 °C Temperature blank.

LABORATORY (Other than Calscience Courier):

- _____ °C Temperature blank.
- _____ °C IR thermometer.
- _____ Ambient temperature.

Initial: AM

CUSTODY SEAL INTACT:

Sample(s): _____ Cooler: _____ No (Not Intact) : _____ Not Present: ✓

Initial: AM

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody document(s) received with samples	✓		
Sampler's name indicated on COC	✓		
Sample container label(s) consistent with custody papers	✓		
Sample container(s) intact and good condition	✓		
Correct containers and volume for analyses requested	✓		
Proper preservation noted on sample label(s)			✓
VOA vial(s) free of headspace.			✓
Tedlar bag(s) free of condensation			✓

Initial: AM

COMMENTS:

Calscience
Environmental
Laboratories, Inc.

April 18, 2007

Rick Rees
Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Subject: **Calscience Work Order No.: 07-04-0863**
Client Reference: AEROJET-AISA / 7190.005

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 4/12/2007 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Don Burley
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.		Date Received:	04/12/07
250 East Rincon Street, Suite 204		Work Order No:	07-04-0863
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA / 7190.005 — Page 1 of 2

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-76-7.5	**07-04-0863-1**	**04/12/07**	**Solid**	**LC/MS 1**	**04/13/07**	**04/18/07**	**070417L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	60	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-76-10	**07-04-0863-2**	**04/12/07**	**Solid**	**LC/MS 1**	**04/13/07**	**04/18/07**	**070417L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	31	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-76-15	**07-04-0863-3**	**04/12/07**	**Solid**	**LC/MS 1**	**04/13/07**	**04/18/07**	**070417L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	16	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-76-20	**07-04-0863-4**	**04/12/07**	**Solid**	**LC/MS 1**	**04/13/07**	**04/18/07**	**070417L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	14	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-76-25	**07-04-0863-5**	**04/12/07**	**Solid**	**LC/MS 1**	**04/13/07**	**04/18/07**	**070417L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-76-30	**07-04-0863-6**	**04/12/07**	**Solid**	**LC/MS 1**	**04/13/07**	**04/18/07**	**070417L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Date Received: 04/12/07
Work Order No: 07-04-0863
Preparation: Cartridge
Method: EPA 6850

Project: AEROJET-AISA / 7190.005

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-76-35	**07-04-0863-7**	**04/12/07**	**Solid**	**LC/MS 1**	**04/13/07**	**04/18/07**	**070417L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

PSZB-76-40	**07-04-0863-8**	**04/12/07**	**Solid**	**LC/MS 1**	**04/13/07**	**04/18/07**	**070417L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

PSZB-77-7.5	**07-04-0863-9**	**04/12/07**	**Solid**	**LC/MS 1**	**04/13/07**	**04/18/07**	**070417L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

PSZB-77-10	**07-04-0863-10**	**04/12/07**	**Solid**	**LC/MS 1**	**04/13/07**	**04/18/07**	**070417L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	11	6.0	1		ug/kg

Method Blank	**099-12-496-13**	**N/A**	**Solid**	**LC/MS 1**	**04/13/07**	**04/18/07**	**070417L01**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Geomatrix Consultants, Inc.	Date Received: 04/12/07
250 East Rincon Street, Suite 204	Work Order No: 07-04-0863
Corona, CA 92879-1363	Preparation: Cartridge
	Method: EPA 6850

Project AEROJET-AISA / 7190.005

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
PSZB-76-25	**Solid**	**LC/MS 1**	**04/13/07**	**04/18/07**	**070417S01**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	90	93	50-150	4	0-30	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Geomatrix Consultants, Inc.	Date Received:	N/A
250 East Rincon Street, Suite 204	Work Order No:	07-04-0863
Corona, CA 92879-1363	Preparation:	Cartridge
	Method:	EPA 6850

Project: AEROJET-AISA / 7190.005

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-496-13	**Solid**	**LC/MS 1**	**04/13/07**	**04/18/07**	**070417L01**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	99	100	60-140	2	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 07-04-0863

Qualifier	Definition
*	See applicable analysis comment.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike or Matrix Spike Duplicate compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported with no further corrective action required.
A	Result is the average of all dilutions, as defined by the method.
B	Analyte was present in the associated method blank.
C	Analyte presence was not confirmed on primary column.
E	Concentration exceeds the calibration range.
H	Sample received and/or analyzed past the recommended holding time.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
N	Nontarget Analyte.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
U	Undetected at the laboratory method detection limit.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

CHAIN-OF-CUSTODY RECORD

0863 COR 11187

PROJECT NAME: AISA			DATE: 12 April 2007 PAGE 1 OF 1
PROJECT NUMBER: 7190.005	LABORATORY NAME: Ca/Science	CLIENT INFORMATION:	REPORTING REQUIREMENTS:
RESULTS TO: Rick Kass	LABORATORY ADDRESS:		
TURNAROUND TIME: Standard			
SAMPLE SHIPMENT METHOD: Courier	LABORATORY CONTACT: Dan Burdy		GEOTRACKER REQUIRED YES NO
	LABORATORY PHONE NUMBER: 714-895-5494		SITE SPECIFIC GLOBAL ID NO.

SAMPLERS (SIGNATURE):

	DATE	TIME	SAMPLE NUMBER	ANALYSES: EPA 8260	CONTAINER TYPE AND SIZE	Soil (S), Water (W), Vapor (V), or Other (O)	Filtered	Preservative Type	Cooled	MS/MSD	No. of Containers	ADDITIONAL COMMENTS
1	04-12-07	0710	PSZB-76-7.5	X	4-oz glass jar	S			X		1	
2		0714	PSZB-76-10	X								
3		0729	PSZB-76-15	X								
4		0730	PSZB-76-20	X								
5		0746	PSZB-76-25	X								
6		0749	PSZB-76-30	X								
7		0756	PSZB-76-35	X								
8		0759	PSZB-76-40	X								
9		0954	PSZB-77-7.5	X								
10	04-12-07	0958	PSZB-77-10	X	4-oz glass jar	S			X		1	

EJS 04-12-07

TOTAL NUMBER OF CONTAINERS: 10

SAMPLING COMMENTS:

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
SIGNATURE:	04-12-07	10:30	SIGNATURE:	4/12/7	10:30
PRINTED NAME: Lucas E. Buday			PRINTED NAME: Abel Marquez		
COMPANY: Geomatrix			COMPANY: CEL		
SIGNATURE:	4/12/7	14:30	SIGNATURE:		1130
PRINTED NAME: Abel Marquez			PRINTED NAME: Sheri Fama		
COMPANY: CEL			COMPANY: (CEL) 04.12.07		
SIGNATURE:			SIGNATURE:		
PRINTED NAME:			PRINTED NAME:		
COMPANY:			COMPANY:		

250 East Rincon Street, Suite 204
Corona, California 92879-1363
Tel 951.273.7400 Fax 951.273.7420

Geomatrix

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 07 - 04 - 0863

Cooler 1 of 1

SAMPLE RECEIPT FORM

CLIENT: GEOMATRIX **DATE:** 4/12/07

TEMPERATURE – SAMPLES RECEIVED BY:

CALSCIENCE COURIER:

- _____ Chilled, cooler with temperature blank provided.
- ✓ Chilled, cooler without temperature blank.
- _____ Chilled and placed in cooler with wet ice.
- _____ Ambient and placed in cooler with wet ice.
- _____ Ambient temperature.

3.8 °C Temperature blank.

LABORATORY (Other than Calscience Courier):

- _____ °C Temperature blank.
- _____ °C IR thermometer.
- _____ Ambient temperature.

Initial: AM

CUSTODY SEAL INTACT:

Sample(s): _____ Cooler: _____ No (Not Intact) : _____ Not Present: ✓

Initial: AM

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody document(s) received with samples	✓		
Sampler's name indicated on COC	✓		
Sample container label(s) consistent with custody papers	✓ ~~AB~~	✓	
Sample container(s) intact and good condition	✓		
Correct containers and volume for analyses requested	✓		
Proper preservation noted on sample label(s)			✓
VOA vial(s) free of headspace.			✓
Tedlar bag(s) free of condensation			✓

Initial: AM

COMMENTS:

The Sample # 8 was labeled based on time

ID & TIME in C.O.C was BZB-76-40 @ 7:59

ID & TIME in SAMPLE was BSZB-76-35 @ 7:59.

AB

Calscience
Environmental
Laboratories, Inc.

May 02, 2007

Rick Rees
Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Subject: **Calscience Work Order No.: 07-04-1451**
Client Reference: AEROJET-AISA / 7190.006

Dear Client:

Enclosed is an analytical report for the above-referenced project. The samples included in this report were received 4/20/2007 and analyzed in accordance with the attached chain-of-custody.

Unless otherwise noted, all analytical testing was accomplished in accordance with the guidelines established in our Quality Systems Manual, applicable standard operating procedures, and other related documentation. The original report of subcontracted analysis, if any, is provided herein, and follows the standard Calscience data package. The results in this analytical report are limited to the samples tested and any reproduction thereof must be made in its entirety.

If you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,

Calscience Environmental
Laboratories, Inc.
Don Burley
Project Manager

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.		Date Received:	04/20/07
250 East Rincon Street, Suite 204		Work Order No:	07-04-1451
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA / 7190.006

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-85-1	**07-04-1451-1**	**04/20/07**	**Solid**	**LC/MS 1**	**04/24/07**	**05/02/07**	**070501L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-85-2.5	**07-04-1451-2**	**04/20/07**	**Solid**	**LC/MS 1**	**04/24/07**	**05/02/07**	**070501L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-85-5	**07-04-1451-3**	**04/20/07**	**Solid**	**LC/MS 1**	**04/24/07**	**05/02/07**	**070501L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-87-1	**07-04-1451-4**	**04/20/07**	**Solid**	**LC/MS 1**	**04/24/07**	**05/02/07**	**070501L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-87-2.5	**07-04-1451-5**	**04/20/07**	**Solid**	**LC/MS 1**	**04/24/07**	**05/02/07**	**070501L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-87-5	**07-04-1451-6**	**04/20/07**	**Solid**	**LC/MS 1**	**04/24/07**	**05/02/07**	**070501L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Analytical Report

Geomatrix Consultants, Inc.
250 East Rincon Street, Suite 204
Corona, CA 92879-1363

Date Received: 04/20/07
Work Order No: 07-04-1451
Preparation: Cartridge
Method: EPA 6850

Project: AEROJET-AISA / 7190.006

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-86-1	**07-04-1451-7**	**04/20/07**	**Solid**	**LC/MS 1**	**04/24/07**	**05/02/07**	**070501L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-86-2.5	**07-04-1451-8**	**04/20/07**	**Solid**	**LC/MS 1**	**04/24/07**	**05/02/07**	**070501L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
PSZB-86-5	**07-04-1451-9**	**04/20/07**	**Solid**	**LC/MS 1**	**04/24/07**	**05/02/07**	**070501L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

Client Sample Number	Lab Sample Number	Date Collected	Matrix	Instrument	Date Prepared	Date Analyzed	QC Batch ID
Method Blank	**099-12-496-15**	**N/A**	**Solid**	**LC/MS 1**	**04/24/07**	**05/02/07**	**070501L02**

Parameter	Result	RL	DF	Qual	Units
Perchlorate	ND	6.0	1		ug/kg

RL - Reporting Limit , DF - Dilution Factor , Qual - Qualifiers

Calscience Environmental Laboratories, Inc.

Quality Control - Spike/Spike Duplicate

Geomatrix Consultants, Inc.	Date Received: 04/20/07
250 East Rincon Street, Suite 204	Work Order No: 07-04-1451
Corona, CA 92879-1363	Preparation: Cartridge
	Method: EPA 6850

Project AEROJET-AISA / 7190.006

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	MS/MSD Batch Number
PSZB-86-5	**Solid**	**LC/MS 1**	**04/24/07**	**05/02/07**	**070501S02**

Parameter	MS %REC	MSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	81	91	50-150	11	0-30	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Quality Control - LCS/LCS Duplicate

Geomatrix Consultants, Inc.		Date Received:	N/A
250 East Rincon Street, Suite 204		Work Order No:	07-04-1451
Corona, CA 92879-1363		Preparation:	Cartridge
		Method:	EPA 6850

Project: AEROJET-AISA / 7190.006

Quality Control Sample ID	Matrix	Instrument	Date Prepared	Date Analyzed	LCS/LCSD Batch Number
099-12-496-15	**Solid**	**LC/MS 1**	**04/24/07**	**05/02/07**	**070501L02**

Parameter	LCS %REC	LCSD %REC	%REC CL	RPD	RPD CL	Qualifiers
Perchlorate	98	96	60-140	2	0-25	

RPD - Relative Percent Difference , CL - Control Limit

Calscience Environmental Laboratories, Inc.

Glossary of Terms and Qualifiers

Work Order Number: 07-04-1451

Qualifier	Definition
*	See applicable analysis comment.
1	Surrogate compound recovery was out of control due to a required sample dilution, therefore, the sample data was reported without further clarification.
2	Surrogate compound recovery was out of control due to matrix interference. The associated method blank surrogate spike compound was in control and, therefore, the sample data was reported without further clarification.
3	Recovery of the Matrix Spike or Matrix Spike Duplicate compound was out of control due to matrix interference. The associated LCS and/or LCSD was in control and, therefore, the sample data was reported without further clarification.
4	The MS/MSD RPD was out of control due to matrix interference. The LCS/LCSD RPD was in control and, therefore, the sample data was reported without further clarification.
5	The PDS/PDSD associated with this batch of samples was out of control due to a matrix interference effect. The associated batch LCS/LCSD was in control and, hence, the associated sample data was reported with no further corrective action required.
A	Result is the average of all dilutions, as defined by the method.
B	Analyte was present in the associated method blank.
C	Analyte presence was not confirmed on primary column.
E	Concentration exceeds the calibration range.
H	Sample received and/or analyzed past the recommended holding time.
J	Analyte was detected at a concentration below the reporting limit and above the laboratory method detection limit. Reported value is estimated.
N	Nontarget Analyte.
ND	Parameter not detected at the indicated reporting limit.
Q	Spike recovery and RPD control limits do not apply resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater.
U	Undetected at the laboratory method detection limit.
X	% Recovery and/or RPD out-of-range.
Z	Analyte presence was not confirmed by second column or GC/MS analysis.

CHAIN-OF-CUSTODY RECORD

COR 1016

(1451)

PROJECT NAME: AEROJET - AISA			DATE: 4.20.07 PAGE 1 OF 1
PROJECT NUMBER: 7190.006	LABORATORY NAME: CALSCIENCE	CLIENT INFORMATION: GEOMATRIX	REPORTING REQUIREMENTS:
RESULTS TO: RICK REES	LABORATORY ADDRESS:		
TURNAROUND TIME: NORMAL			
SAMPLE SHIPMENT METHOD: LAB COURIER	LABORATORY CONTACT: DOU BURLEY		GEOTRACKER REQUIRED YES NO
	LABORATORY PHONE NUMBER: 714-895-5494		SITE SPECIFIC GLOBAL ID NO.

SAMPLERS (SIGNATURE): P. Reese

DATE	TIME	SAMPLE NUMBER	ANALYSES: EPA 6850	CONTAINER TYPE AND SIZE	Soil (S), Water (W), Vapor (V), or Other (O)	Filtered	Preservative Type	Cooled	MS/MSD	No. of Containers	ADDITIONAL COMMENTS
4.20.07	1045	PSZB-85-1	X	4 oz Jar	S			X		1	
4.20.07	1050	PSZB-85-2.5	X	4 oz. Jar	S			X		1	
4.20.07	1055	PSZB-85-5	X	4 oz. Jar	S			X		1	
4.20.07	1215	PSZB-87-1	X	4 oz. Jar	S			X		1	
4.20.07	1240	PSZB-87-2.5	X	4 oz Jar	S			X		1	
4.20.07	1245	PSZB-87-5	X	4 oz. Jar	S			X		1	
4.20.07	1400	PSZB-86-1	X	4 oz. Jar	S			X		1	
4.20.07	1405	PSZB-86-2.5	X	4 oz. Jar	S			X		1	
4.20.07	1410	PSZB-86-5	X	4 oz. Jar	S			X		1	

RELINQUISHED BY:	DATE	TIME	RECEIVED BY:	DATE	TIME
SIGNATURE:	4.20.2007	1500	SIGNATURE:	4/20/07	1500
PRINTED NAME: Dan Jeffers			PRINTED NAME: BAC TA		
COMPANY: Geomatrix			COMPANY: CEL		
SIGNATURE:	4/20/07	1600	SIGNATURE:	4/20/07	1600
PRINTED NAME: BAC TA			PRINTED NAME: CEL		
COMPANY: CEL			COMPANY:		
SIGNATURE:			SIGNATURE:		
PRINTED NAME:			PRINTED NAME:		
COMPANY:			COMPANY:		

TOTAL NUMBER OF CONTAINERS: 9

SAMPLING COMMENTS:

250 East Rincon Street, Suite 204
Corona, California 92879-1363
Tel 951.273.7400 Fax 951.273.7420

Geomatrix

Calscience Environmental Laboratories, Inc.

WORK ORDER #: 07 - 04 - 1451

Cooler 1 of 1

SAMPLE RECEIPT FORM

CLIENT: Geomatrix DATE: 4/20/7

TEMPERATURE – SAMPLES RECEIVED BY:

CALSCIENCE COURIER:

_____ Chilled, cooler with temperature blank provided.
_____ Chilled, cooler without temperature blank.
✓ Chilled and placed in cooler with wet ice.
_____ Ambient and placed in cooler with wet ice.
_____ Ambient temperature.

3.9 °C Temperature blank.

LABORATORY (Other than Calscience Courier):

_____ °C Temperature blank.
_____ °C IR thermometer.
_____ Ambient temperature.

Initial: [signature]

CUSTODY SEAL INTACT:

Sample(s): _____ Cooler: _____ No (Not Intact) : _____ Not Present: ✓

Initial: [signature]

SAMPLE CONDITION:

	Yes	No	N/A
Chain-Of-Custody document(s) received with samples	✓		
Sampler's name indicated on COC	✓		
Sample container label(s) consistent with custody papers	✓		
Sample container(s) intact and good condition	✓		
Correct containers and volume for analyses requested	✓		
Proper preservation noted on sample label(s)			✓
VOA vial(s) free of headspace.			✓
Tedlar bag(s) free of condensation			✓

Initial: [signature]

COMMENTS: